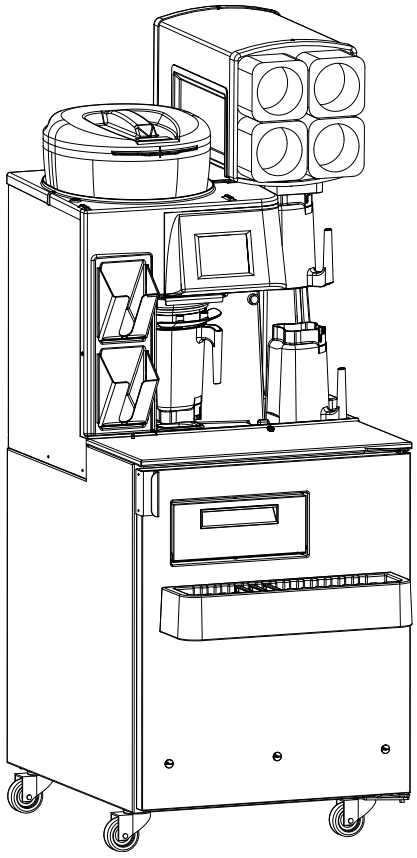
Blended Ice Machine
Multiplex Models MS-8-1H, MS-8-EH
Service Manual

Manufactured exclusively for
McDonald's® By:

Manitowoc Foodservice
Tel. (888) 436-5442
Tel. (989) 773-7981
Fax (888) 779-2040



Blended Ice Machine
Multiplex MS-8-1H, MS-8-EH

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Important Warning And Safety Information

WARNING **READ THIS MANUAL THOROUGHLY BEFORE OPERATING, INSTALLING, OR PERFORMING MAINTENANCE ON THE EQUIPMENT.**

WARNING **FAILURE TO FOLLOW INSTRUCTIONS IN THIS MANUAL CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.**

WARNING **DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.**

WARNING **UNLESS ALL COVER AND ACCESS PANELS ARE IN PLACE AND PROPERLY SECURED, DO NOT OPERATE THIS EQUIPMENT.**

WARNING **THIS APPLIANCE IS NOT INTENDED FOR USE BY PERSONS WHO LACK EXPERIENCE OR KNOWLEDGE, UNLESS THEY HAVE BEEN GIVEN SUPERVISION OR INSTRUCTION CONCERNING USE OF THE APPLIANCE BY A PERSON RESPONSIBLE FOR THEIR SAFETY.**

WARNING **THIS APPLIANCE IS NOT TO BE PLAYED WITH.**

WARNING **DO NOT CLEAN WITH WATER JET.**

WARNING **DO NOT USE ELECTRICAL APPLIANCES INSIDE THE FOOD STORAGE COMPARTMENT OF THIS APPLIANCE.**

CAUTION **Observe the following:**

- **Minimum clearances must be maintained from all walls and combustible materials.**
- **Keep the equipment area free and clear of combustible material.**
- **Adequate clearance for air openings.**
- **Operate equipment only on the type of electricity indicated on the specification plate.**
- **Retain this manual for future reference.**

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General Information

Model Numbers

This manual covers the Blended Ice Machine, model numbers **MS-8-1H and MS-8-EH**.

Serial Number Location

This number is required when requesting information from your local distributor. The serial number is listed on the SERIAL NUMBER DECAL affixed to the middle of the lower back panel on the Blended Ice Machine. A second decal is located on the front right side of cup dispenser.

General Warranty Information

Your Blended Ice Machine comes with a three-year warranty on parts and labor and a five-year warranty on compressor. Consult your local Multiplex Distributor for terms and conditions of your warranty. Your warranty specifically excludes all general adjustments, cleaning, accessories and related servicing.

The warranty card must be returned to activate the warranty on this equipment. If a warranty card is not returned, the warranty period can begin when the equipment leaves the Multiplex factory.

No equipment may be returned to without a written Return Materials Authorization (RMA). Equipment returned without an RMA will be refused at dock and returned to the sender at the sender's expense.

Please contact your local distributor for return procedures.

The following Warranty outline is provided for your convenience. For a detailed explanation, read the warranty bond shipped with each product.

Contact your local Multiplex representative or Multiplex if you need further warranty information.

PARTS

Multiplex warrants the Blended Ice Machine against defects in materials and workmanship, under normal use and service for three (3) years from the date of original installation.

The evaporator and compressor are covered by an additional two (2) year (five years total) warranty beginning on the date of the original installation.

LABOR

Labor required to repair or replace defective components is covered for three (3) years from the date of original installation.

EXCLUSIONS

The following items are not included in the Blended Ice Machine warranty coverage:

Normal maintenance, adjustments and cleaning as outlined in this manual.

Repairs due to unauthorized modifications to the Blended Ice Machine or use of non-standard parts without prior written approval from Multiplex.

Damage caused by improper installation of the Blended Ice Machine, electrical supply, water supply or drainage, or damage caused by floods, storms, or other acts of God.

Premium labor rates due to holidays, overtime, etc.; travel time; flat rate service call charges; mileage and miscellaneous tools and material charges not listed on the payment schedule. Additional labor charges resulting from the inaccessibility of equipment are also excluded.

Parts or assemblies subjected to misuse, abuse, neglect or accidents.

Damage or problems caused by installation, cleaning and/or maintenance procedures inconsistent with the technical instructions provided in this manual.

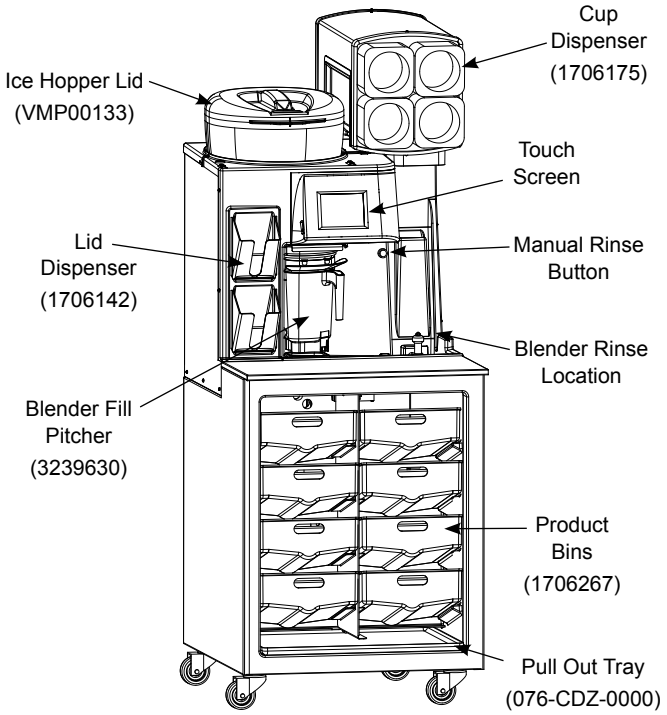
Authorized Warranty Service

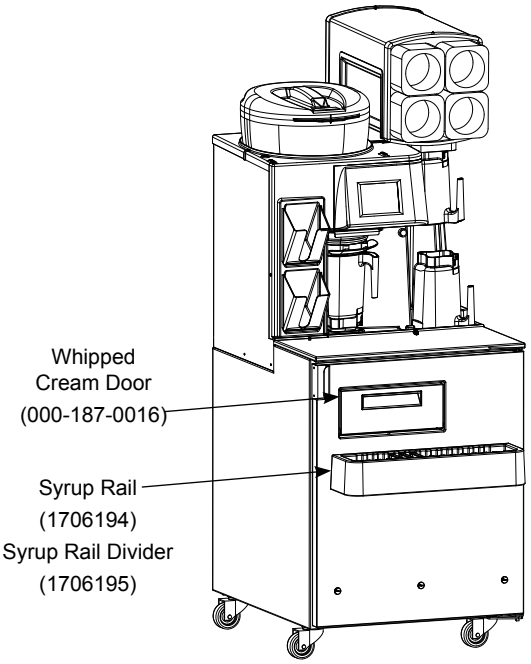
To comply with the provisions of the warranty, a refrigeration service company qualified and authorized by your Multiplex Distributor, or a Contracted Service Representative must perform the warranty repair.

SERVICE CALLS

Normal maintenance, adjustments and cleaning as outlined in this manual are not covered by the warranty. If you have followed the procedures listed in this manual, and the Blended Ice Machine still does not perform properly, call your Local Distributor or the Multiplex Service Department.

Component Identification





General System Overview

The Blended Ice Machine is a self-contained dispensing unit that allows the operator to make flavor combinations of blended ice drinks. It contains product flavoring in a reach-in enclosure, a refrigeration system and an ice shaving machine.

The operator controls and accesses the unit using a lighted touch screen. Icons on the Drink Selection screen represent the primary flavor combinations for the blended ice drinks. A second screen provides drink size options (S, M, L) and ingredient options, such as “no yogurt.” Menu changes and additions are uploaded using a USB mass storage device.

On-screen instructions also include operator procedures for cleaning/sanitizing, checking inventory, replacing product bags, selecting drink sizes and manually preparing drinks. Managers and technicians have access to menu/software updates, diagnostics and other service screens.

Part Description	Number
Blender Fill Pitcher	3239630
Cleaning Kit	000-BIC-0008
Cleaning Pitcher	3239631
Cup Dispenser	1706175
Gasket, Door	1706208
Gasket, Whipped Cream Door	1706209
Hinge Kit	RF000066
Ice Hopper Lid	VMP00133
Lid Dispenser	1706142
Product Bin	1706267
Pull Out Tray	076-CDZ-0000
Syrup Rail	1706194
Syrup Rail Divider	1706195
Whipped Cream Door	000-187-0016

Electrical

GENERAL

⚠ Warning

All wiring must conform to local, state and national codes.

MINIMUM CIRCUIT AMPACITY

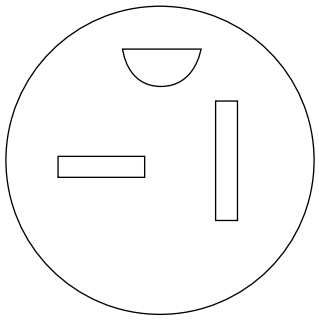
The minimum circuit ampacity is used to help select the wire size of the electrical supply. (Minimum circuit ampacity is not the Blended Ice Machine's running amp load.) The wire size (or gauge) is also dependent upon location, materials used, length of run, etc., so it must be determined by a qualified electrician.

ELECTRICAL REQUIREMENTS

Refer to Blended Ice Machine Model/Serial Plate for voltage/amperage specifications.

VOLTAGE

The standard voltage is 120VAC-60Hz. A power cord is provided with a NEMA 5-20P electrical plug. A dedicated electrical circuit is required.



NEMA 5-20P Plug Configuration

MINIMUM CIRCUIT AMPERAGE CHART

Important

Due to continuous improvements, this information is for reference only. Please refer to the serial number tag to verify electrical data. Serial tag information overrides information listed on this page.

Model Numbers	Voltage/Cycle	Total Amps	Breaker Size
MS-8-1H 8 flavor	115/60/1	16.0	20A
MS-8-EH 8 flavor	230-240/50/1	9.8	16A

GROUNDING INSTRUCTIONS

⚠ Warning

The machine must be grounded in accordance with national and local electrical codes.

This appliance must be grounded. In the event of malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This appliance is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

EXPORT NOTE: For export models replace the supply cord with a 1.5mm^2 minimum, 3 conductor H05VV-F harmonized cord.

Clearance Requirements

Model	Air Cooled
Top	8" (20 cm)
Sides	6" (15 cm)
Back	6" (15 cm)
Front	30" (76 cm)

Heat of Rejection

Model	Heat of Rejection	
	Air Conditioning	Peak
MS-8-1H	2100	2600
MS-8-EH	2100	2600

General Specifications

Temperature Control Setting	36°F setpoint 4°F differential 2°C setpoint 2°C differential controlled by software
Ice Capacity	23 lbs (10 kg)
Shipping Weight	430 lbs (195 kg)
Product Bin Capacity	19.8lbs (9kg) per bin
CO_2 Regulator Setting	40lbs
Water Regulator Setting	30lbs

Location

The location selected for the Blended Ice Machine must meet the following criteria.

- The air temperature must be at least 40°F (4°C), but must not exceed 90°F (32°C), climate class 4.
- The location must not be near heat-generating equipment or in direct sunlight and must be protected from weather.
- Water temperature min/max = 40°F/110°F (4°C/43°C).
- Water pressure min/max = 20 psi/40 psi (138kPa/276kPa)
- Always use the water supply line supplied when installing this appliance. Never reuse an old supply line.
- Main supply CO_2 pressure to Blended Ice Machine regulator min/max = 100 psi/150 psi (689kPa/1034kPa)

⚠ Warning

Carbon Dioxide (CO_2) displaces oxygen. Exposure to a high concentration of CO_2 gas causes tremors, which are followed rapidly by loss of consciousness and suffocation. If a CO_2 gas leak is suspected, particularly in a small area, immediately ventilate the area before repairing the leak. CO_2 lines and pumps must not be installed in an enclosed space. An enclosed space can be a cooler or small room or closet. This may include convenience stores with glass door self serve coolers. If you suspect CO_2 may build up in an area, venting of the B-I-B pumps and / or CO_2 monitors must be utilized.

Maintenance

Door Gasket Maintenance

Door gaskets require regular cleaning to prevent mold and mildew build up and also to retain the elasticity of the gasket. Gasket cleaning can be done with the use of warm soapy water. Avoid full strength cleaning products on gaskets as this can cause them to become brittle and crack. Never use sharp tools or knives to scrape or clean the gasket. Gaskets can be easily replaced and do not require the use of tools or an authorized service person. The gaskets are “Dart” style and can be pulled out of the groove in the door and new gaskets can be “pressed” back into place.

Drain Maintenance - Base

Each unit has a drain located inside the unit that removes the condensation from the evaporator coil and routes it to an external condensate evaporator pan. Each drain can become loose or disconnected during normal use. If you notice water accumulation on the inside of the unit be sure the drain tube is connected to the evaporator drain pan. If water is collecting underneath the unit make sure the end of the drain tube is in the condensate evaporator in the machine compartment. The leveling of the unit is important as the units are designed to drain properly when level. Be sure all drain lines are free of obstructions.

Caster Maintenance

Wipe casters with a damp cloth monthly to prevent corrosion.

The power switch must be turned to OFF and the unit disconnected from the power source whenever performing service, maintenance functions or cleaning the refrigerated area.

Refrigerators

The interior and exterior can be cleaned using soap and warm water. If this isn’t sufficient, try ammonia and water or a nonabrasive liquid cleaner. When cleaning the exterior, always rub with the “grain” of the stainless steel to avoid marring the finish. Do not use an abrasive cleaner because it will scratch the stainless steel and can damage the breaker strips and gaskets.

Stainless Steel Care and Cleaning

To prevent discoloration or rust on stainless steel several important steps need to be taken. First, we need to understand the properties of stainless steel. Stainless steel contains 70- 80% iron, which will rust. It also contains 12-30% chromium, which forms an invisible passive film over the steel’s surface, which acts as a shield against corrosion. As long as the protective layer is intact, the metal is still stainless. If the film is broken or contaminated, outside elements can begin to breakdown the steel and begin to form discoloration or rust. Proper cleaning of stainless steel requires soft cloths or plastic scouring pads.

NEVER USE STEEL PADS, WIRE BRUSHES OR SCRAPERS!

Cleaning solutions need to be alkaline based or non-chloride cleaners. Any cleaner containing chlorides will damage the protective film of the stainless steel. Chlorides are also commonly found in hard water, salts, and household and industrial cleaners. If cleaners containing chlorides are used be sure to rinse repeatedly and dry thoroughly. Routine cleaning of stainless steel can be done with soap and water. Extreme stains or grease should be cleaned with a non-abrasive cleaner and plastic scrub pad. Always rub with the grain of the steel. There are stainless steel cleaners available which can restore and preserve the finish of the steels protective layer. Early signs of stainless steel breakdown are small pits and cracks. If this has begun, clean thoroughly and start to apply stainless steel cleaners in attempt to restore the passivity of the steel.

Never use an acid based cleaning solution! Many food products have an acidic content, which can deteriorate the finish. Be sure to clean the stainless steel surfaces of ALL food products. Common items include, tomatoes, peppers and other vegetables.

Cleaning the Condenser Coil

In order to maintain proper refrigeration performance, the condenser fins must be cleaned of dust, dirt and grease regularly. It is recommended that this be done at least every three months. If conditions are such that the condenser is totally blocked in three months, the frequency of cleaning should be increased. Clean the condenser with a vacuum cleaner or stiff brush. If extremely dirty, a commercially available condenser cleaner may be required.

Failure to maintain a clean condenser coil can initially cause high temperatures and excessive run times. Continuous operation with a dirty or clogged condenser coil can result in compressor failure. Neglecting the condenser coil cleaning procedures will void any warranties associated with the compressor and cost to replace the compressor.

Never use a high-pressure water wash for this cleaning procedure as water can damage the electrical components located near or at the condenser coil.

Doors/Hinges

Over time and with heavy use doors the hinges may become loose. If this happens tighten the screws that mount the hinge brackets to the frame of the unit. Loose or sagging doors can cause the hinges to pull out of the frame, which may damage both the doors and the hinges. In some cases this may require qualified service agents or maintenance personnel to perform repairs.

Do not place hot pans on/against the blue ABS liner. Do not throw items into the storage area. Failure to follow these recommendations could result in damage to the interior of the cabinet or to the blower coil. Overloading the storage area, restricting the airflow, and continuous opening and closing of the doors and drawers will hamper the units ability to maintain operational temperature.

Preventing blower coil corrosion

To help prevent corrosion of the blower coil, store all acidic items, such as pickles and tomatoes, in sealable containers. Immediately wipe up all spills.

Continuous opening and closing of the doors will hamper the unit’s ability to maintain optimum refrigeration temperature. Top section is not intended for overnight storage. Product should be removed from pans. Pans can remain in unit while empty.

Clean Blended Ice Machine (BIM-8) | Daily | BE 23 D1

Why	To break the bacteria cycle	
Time required	5 minutes to prepare	15 minutes to complete
Time of day	At close	For 24-hour restaurants: During low-volume periods
Hazard icons	Chemicals	

Precaution: **Hazard Communication Standard (HCS) – The procedures on this card include the use of chemical products. These chemical products will be highlighted with bold face letters followed by the abbreviation (HCS) in the tools portion of the procedure. See the Hazard Communication Standard (HCS) manual for the appropriate Material Safety Data Sheet(s) (MSDS).**

Tools and supplies

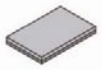
Bucket, clean and sanitized towels

Scoop

Bucket, soiled towels

KAY 5 Sanitizer solution (HCS)

KAY Beverage Equipment Cleaner

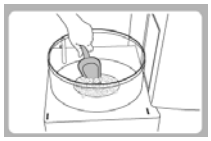

No-Scratch Pad

Procedure

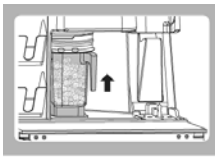
1 Cycle touch pad to cleaning.
On the Menu Screen press Cleaning, then Daily Cleaning.

2 Gather items shown.

3 Empty ice hopper.
Remove ice hopper lid. Use an ice scoop and an empty bucket to remove as much ice as possible from above the ice shelf. Replace ice hopper lid.



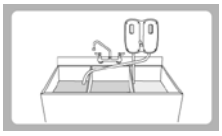
4 Manually dispense ice.
Place a blend pitcher on the pitcher pad. Press Manual Ice Dispense button until ice hopper is empty. Remove blender pitcher of ice and discard in back sink.



5 Remove parts for cleaning and sanitizing.
Remove the following items and take them back to the 3 compartment sink to wash, rinse and sanitize.

- Blender pitchers
- Ice hopper lid
- Syrup rail
- Drip pan
- Splash guard

Do not place parts in "Power Soaker" or dishwasher.



continued ▶

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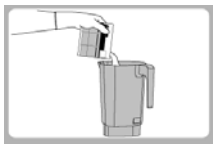
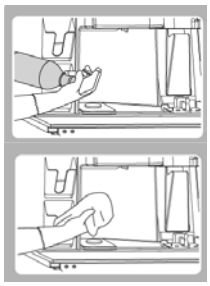
Clean Blended Ice Machine (BIM-8) (continued)

6 **With the blender pitchers at the 3-compartment sink, clean pitchers.**
Place one KAY Beverage Equipment Cleaner packet into the first pitcher and fill with **hot** water from the back sink. Allow the product to soak in the pitcher for 5 minutes. Use a no-scratch pad to remove any film build-up. Pour the solution into the second pitcher and soak for 5 minutes. Once this is done, discard solution, rinse and sanitize both pitchers in the 3-compartment sink. Allow to air dry.



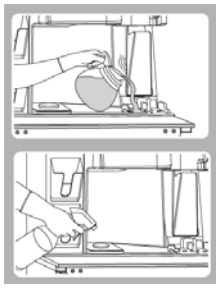
Chemicals
KAY Beverage Equipment Cleaner

7 **Sanitize ice chute**
Use a spray bottle with Sanitizer solution and a sanitized towel to sanitize:
- Above and around the ice chute
- Inside the ice chute



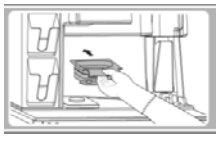
Chemicals
KAY 5 Sanitizer

8 **Clean pitcher pad and drain area.**
- Use coffee pot of hot water from the back sink to rinse drain area and drain.
- Spray the drain area with Sanitizer solution and wipe with a clean sanitize towel.
- Clean top and sides of the pad.

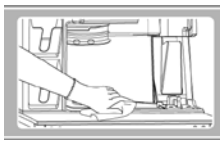


Chemicals
KAY 5 Sanitizer

9 **Re-install all components.**
Blend pitchers, ice hopper lid, syrup rails, drip pan and splash guard.

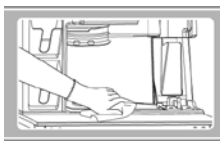


10 **Clean with APSC the interior of the blended ice machine with a clean, sanitized towel dampened with KAY 5 Sanitizer solution:**
- Clean inside the machine.
- Pull out the whipped cream holder and clean the holder and sides inside the machine that hold the holder
- Clean all door gaskets



Chemicals
KAY 5 Sanitizer

11 **Clean with APSC the exterior of the blended ice machine with a clean, sanitized towel dampened with KAY 5 Sanitizer solution:**
- Clean lid holders, cup holder tubes, cabinet, front of door, top of work surface, touch screen, outside of ice hopper



Chemicals
KAY 5 Sanitizer

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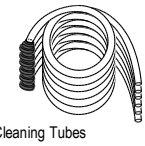
Clean Blended Ice Machine (BIM-8) | Weekly | BE 23 W1

Why	To break the bacteria cycle	
Time required	10 minutes to prepare	50 minutes to complete
Time of day	At close	For 24-hour restaurants: During low-volume periods
Hazard icons	Electricity, Chemicals, Sharp Objects/Surfaces	

Precaution: **Hazard Communication Standard (HCS) – The procedures on this card include the use of chemical products. These chemical products will be highlighted with bold face letters followed by the abbreviation (HCS) in the tools portion of the procedure. See the Hazard Communication Standard (HCS) manual for the appropriate Material Safety Data Sheet(s) (MSDS).**

Tools and supplies

Cleaning Pitcher


Cleaning Tubes

Bucket with SolidSense All Purpose Super Concentrate (APSC)

Bucket with 2 KAY 5 Sanitizer (HCS) packet

Bucket with rinse water

Bio-Shield Dispenser

Bio-Shield Tower Drain Cleaner

Clean, sanitizer-soaked towels

Bucket, soiled towels

KAY 5 Sanitizer Solution

Scoop

Empty bucket

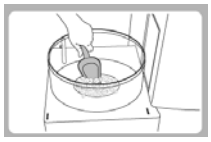
KAY Beverage Equipment Cleaner

Procedure

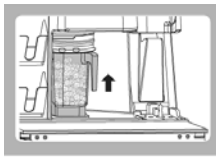
1 Cycle touch pad to cleaning.
On the Menu screen press Cleaning, then Weekly Cleaning.

2 Gather items shown.

3 Empty ice hopper.
Remove ice hopper lid. Use an ice scoop and an empty bucket to remove as much ice as possible from above the ice shelf. Replace ice hopper lid.



4 Manually dispense ice.
Place a blend pitcher on the pitcher pad. Press Manual Ice Dispense button until ice hopper is empty. Remove blender pitcher of ice and discard in back sink.



5 Fill each labeled bucket to the fill line with the appropriate solution and bring to machine.
Fill APSC bucket with hot SolidSense APSC from dispenser at 3-compartment sink.
Fill RINSE bucket with warm, clean water.
Fill SANITIZE bucket with 5 gallons of lukewarm water and 2 packets of KAY 5 Sanitizer and mix thoroughly.

continued ▶

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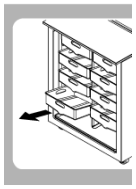
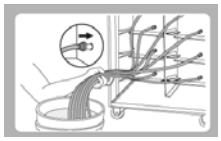
Clean Blended Ice Machine (BIM-8) (continued)

6 **Remove product bins and bags.**
Remove each product bag from the product bin and place in walk-in cooler. Take product bins to 3-compartment sink and wash, rinse and sanitize. Allow to air dry.

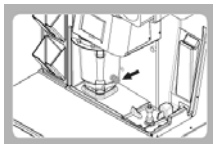


7 **Connect cleaning tubes.**
Connect one tube from the cleaning tubes to each inlet line. Insert the free end of the tubes into the bucket of clean SolidSense APSC solution. All lines must be cleaned including unused.

Chemicals
SolidSense APSC solution



8 **Place black cleaning pitcher on pitcher pad.**



9 **Press Next.**
The message window will display: "APSC cleaning of Strawberry Banana Line", then change to the next flavor until all lines have been cleaned. If cleaner solution runs low, press Pause, refill the bucket with cleaner solution and press Resume. After the last line is cleaned, the next cleaning screen will appear.

10 **Remove tubes from the APSC bucket and place into the warm water RINSE bucket.**

11 **Press Next.**
The message window will display: "Rinse of Strawberry Banana Line", then change to the next flavor until all lines have been rinsed. If water runs low, press Pause, refill the bucket with warm water and press Resume. After the last line is cleaned, the next cleaning screen will appear.

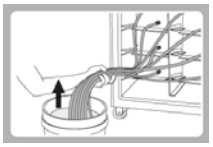
12 **Remove tubes from RINSE bucket and place into the warm water SANITIZE bucket.**

Chemicals
KAY 5 Sanitizer

13 **Press Next.**
The message window will display: "Sanitizer fill of Strawberry Banana Line", then change to the next flavor until all lines have been sanitized. If sanitizer solution runs low, press Pause, refill the bucket with sanitizer solution and press Resume.

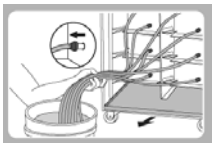
14 **Sanitize Hold**
After the last line is sanitized, "Sanitize Hold" will appear, and then the next cleaning screen will appear.

15 **Remove tubes from Sanitize solution and lay across the top rim of the bucket.**



16 **Press Next.**
The message window will display: "Auto purge of Strawberry Banana Line", then change to the next flavor until all lines have been purged. The next cleaning screen will appear.

17 **Disconnect the cleaning tubes from each product line.**



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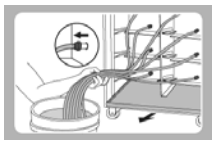
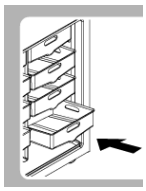
Clean Blended Ice Machine (BIM-8) (continued)

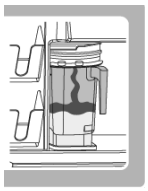
18 **Pull the bottom drain pan from inside the machine.**



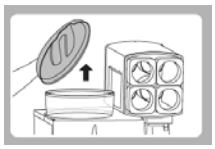
19 **Reconnect product bins and bags.**
Retrieve product bags from walk-in cooler. Install product bags into the product bins. Position the rear groove of the spout on the product bag into the front slot of the product bin. Make sure it's properly snapped into place. Then install each product bin into its proper location.



20 **Replace black cleaning pitcher with blending pitcher.**
Place discharged product in trash or back sink.



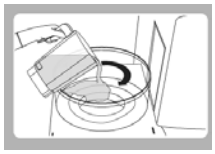
21 **Remove Ice hopper lid.**



22 **Place black cleaning pitcher on the pitcher pad.**

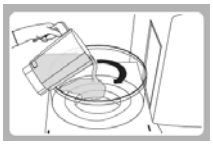
23 **Fill a blend pitcher with SolidSense APSC.**
Chemicals
SolidSense APSC

24 **Pour in SolidSense APSC.**
Slowly pour the SolidSense APSC into the ice hopper in a circular motion, as close to and as high up the inside walls as possible, without splashing solution outside the unit.



25 **Use clean sanitizer-soaked towel to clean inside of hopper.**
Use caution when wiping near the shaver blade.
Sharp Objects/Surfaces

26 **Rinse ice hopper with clean water.**
Fill a blend pitcher with clean water. Slowly pour the clean water into the ice hopper in a circular motion, as close to and as high up the inside walls as possible, without splashing outside the unit. Repeat if needed for a thorough rinse.



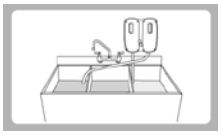
27 **Remove black cleaning pitcher from the pitcher pad, be careful not to splash any remaining solution from the pitcher.**

28 **Spray interior of ice hopper with Sanitizer Solution.**
Allow to air dry.
Sharp Objects/Surfaces
Use caution when near the shaver blade.
Chemicals
KAY 5 Sanitizer

29 **Remove parts for cleaning and sanitizing.**
Remove the following items and take them back to the 3-compartment sink to wash, rinse and sanitize:

- Blend pitchers
- Ice hopper lid
- Syrup rail
- Drip pan
- Splash guard

Do not place parts in "Power Soaker" or dishwasher.



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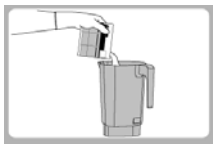
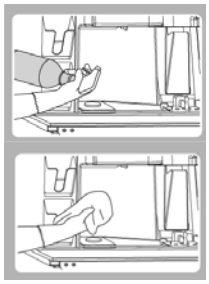
Clean Blended Ice Machine (BIM-8) (continued)

30 **With the blender pitchers at the 3-compartment sink:**
Place one KAY Beverage Equipment Cleaner packet into the first pitcher and fill with **hot** water from the back sink. Allow the product to soak in the pitcher for 5 minutes. Use a no-scratch pad to remove any film build-up. Pour the solution into the second pitcher and soak for 5 minutes. Once this is done, discard solution and rinse and sanitize both pitchers in the 3-compartment sink. Allow to air dry.



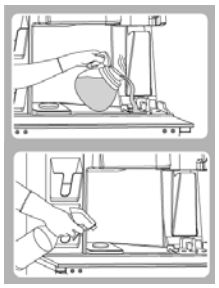
Chemicals
KAY Beverage Equipment Cleaner

31 **Sanitize ice chute**
Use a spray bottle with Sanitizer solution and a sanitized towel to sanitize:
- Above and around the ice chute
- Inside the ice chute



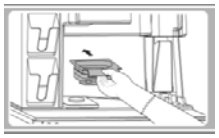
Chemicals
KAY 5 Sanitizer

32 **Clean pitcher pad and drain area.**
- Use coffee pot of hot water from the back sink to rinse drain area and drain.
- Spray the drain area with Sanitizer solution and wipe with a clean sanitize towel.
- Clean top and sides of the pad.

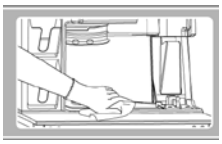


Chemicals
KAY 5 Sanitizer

33 **Re-install all components.**
Blend pitchers, ice hopper lid, syrup rails, drip pan and splash guard.

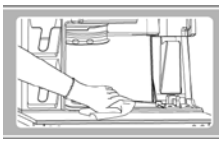


34 **Clean with APSC the interior of the blended ice machine with a clean, sanitized towel dampened with KAY 5 Sanitizer solution:**
- Clean inside the machine.
- Pull out the whipped cream holder and clean the holder and sides inside the machine that hold the holder
- Clean all door gaskets



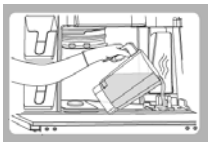
Chemicals
KAY 5 Sanitizer

35 **Clean with APSC the exterior of the blended ice machine with a clean, sanitized towel dampened with KAY 5 Sanitizer solution:**
- Clean lid holders, cup holder tubes, cabinet, front of door, top of work surface, touch screen, outside of ice hopper



Chemicals
KAY 5 Sanitizer

36 **Slowly pour two full pitchers of hot water from the back sink into the rinse area.**



37 **On top of the BIO-SHIELD® dispenser open the pressure relief knob by turning the knob counter clockwise.**

38 **Remove the cap from the BIO-SHIELD® dispenser.**

continued ▶

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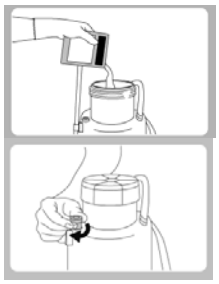
Clean Blended Ice Machine (BIM-8) (continued)

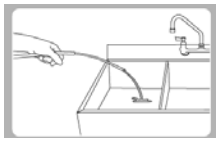
39 **Pour two full pitchers of hot water from the back sink into the dispenser.**

40 **Quickly pour one packet of BIO-SHIELD Beverage Tower Drain Cleaner into the dispenser.**
Immediately replace and tighten the cap. Then on top of the BIO-SHIELD® dispenser close the pressure relief knob by turning the knob clockwise. Shake the dispenser to dissolve the cleaner.

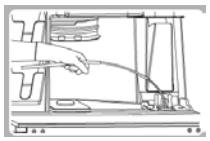
Chemicals
Drain Cleaner.



41 **Carefully purge a small amount of solution from the dispenser into the back sink or utility sink.**
This helps prevent "sputtering" of solution and possible splashing back onto clothing or eyes.



42 **Carefully spray the solution into the rinser sink drain hole.**



43 **Open the pressure relief knob again by turning the knob counter clockwise on top of the BIO-SHIELD® dispenser.**

44 **Remove the cap from the BIO-SHIELD® dispenser.**

45 **Rinse the BIO-SHIELD® dispenser.**
Rinse the BIO-SHIELD® dispenser with warm water and return the dispenser to the proper storage area.
IMPORTANT! Do not use the drain for at least four hours after cleaning. But the machine can still be used.

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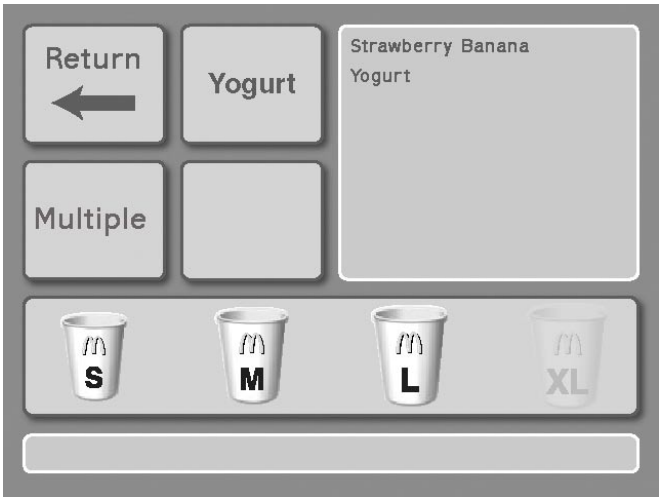
Procedure to Make a Drink

NOTE: Ice must be present in the ice bin and product must be connected and primed to produce a drink.

Drink Selection Touch Screen

1. Place a clean blend container on the container pad.
2. Press the touch screen to select the type of drink desired from list of main menu items. The screen will advance and list the selection. (If the selection is incorrect, press return and reselect).



Size and Option Touch Screen

3. Select drink options:
   - Select Return to view the previous screen.
   - The yogurt button toggles between including and leaving out the yogurt.
   - Select the Multiple button if you want to make multiple drinks of the same flavor.
   - Select drink size(s).

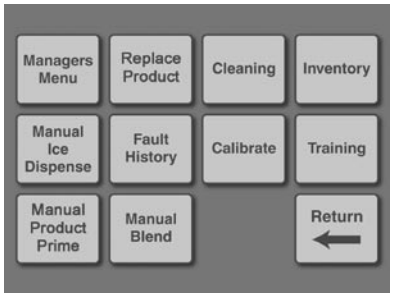
NOTE: A green box will highlight the selections.

4. The machine will add the proper amount of ingredients, blend and stop automatically.
5. Pour the drink into a properly sized cup for the drink selection.
6. Place container in rinse position – container is automatically rinsed.

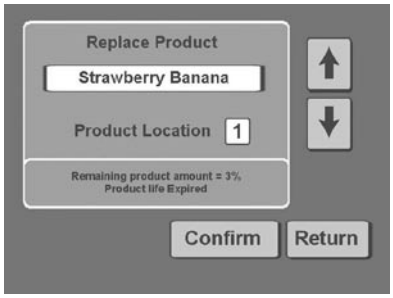
Procedure to Replace a Product Bag

These instructions can be found on the Touch Screen in the Help Menu under “Replace Product”.

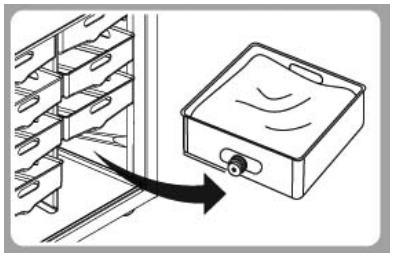
1. Touchscreen will indicate the bag is empty “Drink making paused, check product supply”.
2. Press “Replace product”.



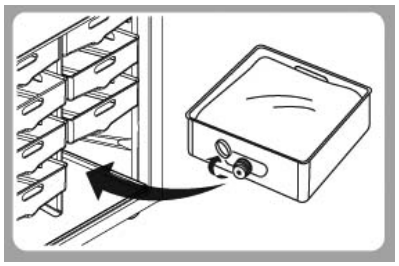
3. Use the arrows and the Confirm button to select the product to be replaced.



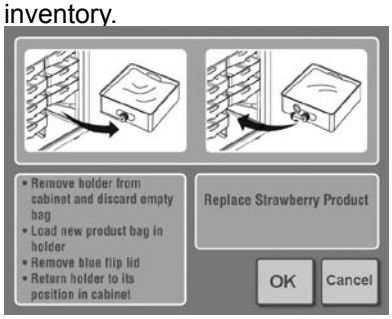
4. Remove product bin from cabinet and discard empty bag.



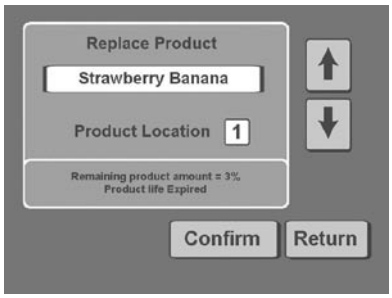
5. Wipe the inside of the product bin with a clean sanitize towel.
6. Place bag in product bin with spout down. Position product bag with the spout facing down. Position the rear groove of the spout on the product bag into the front slot of the product bin. Make sure it’s properly snapped into place.
7. Open the cap on the product bag and tear it off.
8. Return product bin to its position in cabinet.



9. Press OK on touchscreen panel. This will reset inventory.


• Remove holder from cabinet and discard empty bag
• Load new product bag in holder
• Remove blue flip lid
• Return holder to its position in cabinet
Replace Strawberry Product
OK
Cancel

10. Procedure complete. Use the arrows and the Confirm button to select another product to be replaced. Press Return to display the previously active screen.



Shaver Blade Replacement

WARNING: To reduce the risk of injury, unplug the unit before beginning any repair or upgrade work.

WARNING: Shaver and Blender Blades are sharp! Handle with caution to avoid injury.

NOTE: Actual components may differ slightly in appearance from those shown in this Update.

1. Unplug the unit from its power source.
2. Remove the Lid and the Ice Shelf from the Ice Bin.
3. Remove the Shaver Wheel. To do so, hold the Shaver Wheel firmly with one hand while turning the Paddle nut counterclockwise with the other hand, as shown in Figure A. If the Paddle Nut is too tight to loosen by hand, use a pair of pliers. After removing the Paddle Nut, pull the Shaver Wheel up and off of the shaft.
4. The Ice Shaver Blade should now be exposed. Remove the two screws that secure the blade, as shown in Figure B. Note that the screw holes in the Shaver blade are recessed to allow the mounting screws to fit flush with the top surface of the blade. When installing the new Shaver Blade, be sure to mount it with the recessed side facing upward. Also note the number and type of shims underneath the blade (See Figure C.). The two different types of shims are easily distinguishable by their thickness. There may be a number of different shim combinations based on the vintage of your unit, including but not limited to one thin shim alone, one thick shim alone and one thick shim in combination with up to five thin shims. Be sure to note this accurately when you remove the blade.
5. The Ice Shaver Blade Replacement Kit, shown in Figure D, includes:
   - (1) Shaver Blade (STM519) NOTE: The replacement Shaver Blade may differ in appearance from the blade currently installed.
   - (1) Thick Shim (STM517)
   - (4) Thin Shims (STM514)
   - (2) Mounting Screws (FST527) NOTE: Mounting Screws may be a different length than the screws that you currently use.

   Replace the old blade with the blade from the kit, along with the same combination of shims that existed when you removed the old blade. You can reuse the old shims or use the shims provided in the kit as long as the combination is the same as the original. Be sure to mount the blade so that the side with recessed screw holes is facing up.
6. Secure the new blade with the new screws provided. The new screws should be compatible with any shim configuration even if they are longer than the original screws.
7. Replace the shaver wheel and secure the paddle nut as tightly as possible BY HAND. No tools should be required to tighten the paddle nut.
8. MAKE SURE THAT THE PADDLE NUT IS TIGHT AND ROTATE THE SHAVER WHEEL COUNTERCLOCKWISE BY HAND. THERE SHOULD BE NO INTERFERENCE BETWEEN THE SHAVER WHEEL AND THE ICE SHAVER BLADE. IF THERE IS ANY EVIDENCE OF INTERFERENCE SUCH AS A SCRAPING NOISE OR DIFFICULTY TURNING THE SHAVER WHEEL, REMOVE THE SHAVER WHEEL AND THE ICE SHAVER BLADE. YOU CAN LOWER THE BLADE HEIGHT BY REMOVING SHIMS. START BY REMOVING THE THIN SHIMS FIRST, ONE AT A TIME. CHECK FOR INTERFERENCE AFTER REMOVING EACH SHIM. PROCEED TO THE NEXT STEP ONLY WHEN NO INTERFERENCE EXISTS. FAILURE TO ENSURE CLEARANCE CAN RESULT IN DAMAGE TO THE ICE SHAVER BLADE AND/OR THE SHAVER WHEEL.
9. Replace the ice shelf.
10. Fill the ice bin about one-third to one-half full of ice and replace the lid.
11. Plug the unit in.
12. Press the Dispense Ice Button for 10 seconds. The unit should dispense between 12 and 25 ounces of ice during the 10 second period. If the unit dispenses less than this, thin shims can be added one at a time to increase the shave rate. ALWAYS BE AWARE OF CLEARANCE BETWEEN THE SHAVER WHEEL AND THE ICE SHAVER BLADE. FAILURE TO DO SO CAN DAMAGE THE MACHINE.

Figure A. Remove Shaver Wheel

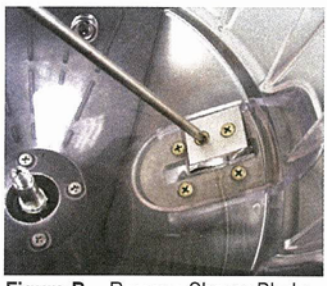


Figure B. Remove Shaver Blade

Figure C. Shaver Blade & Shims

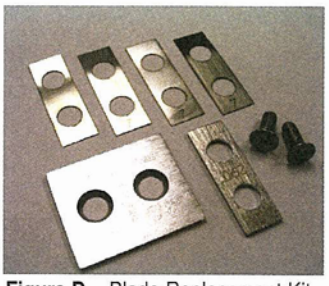
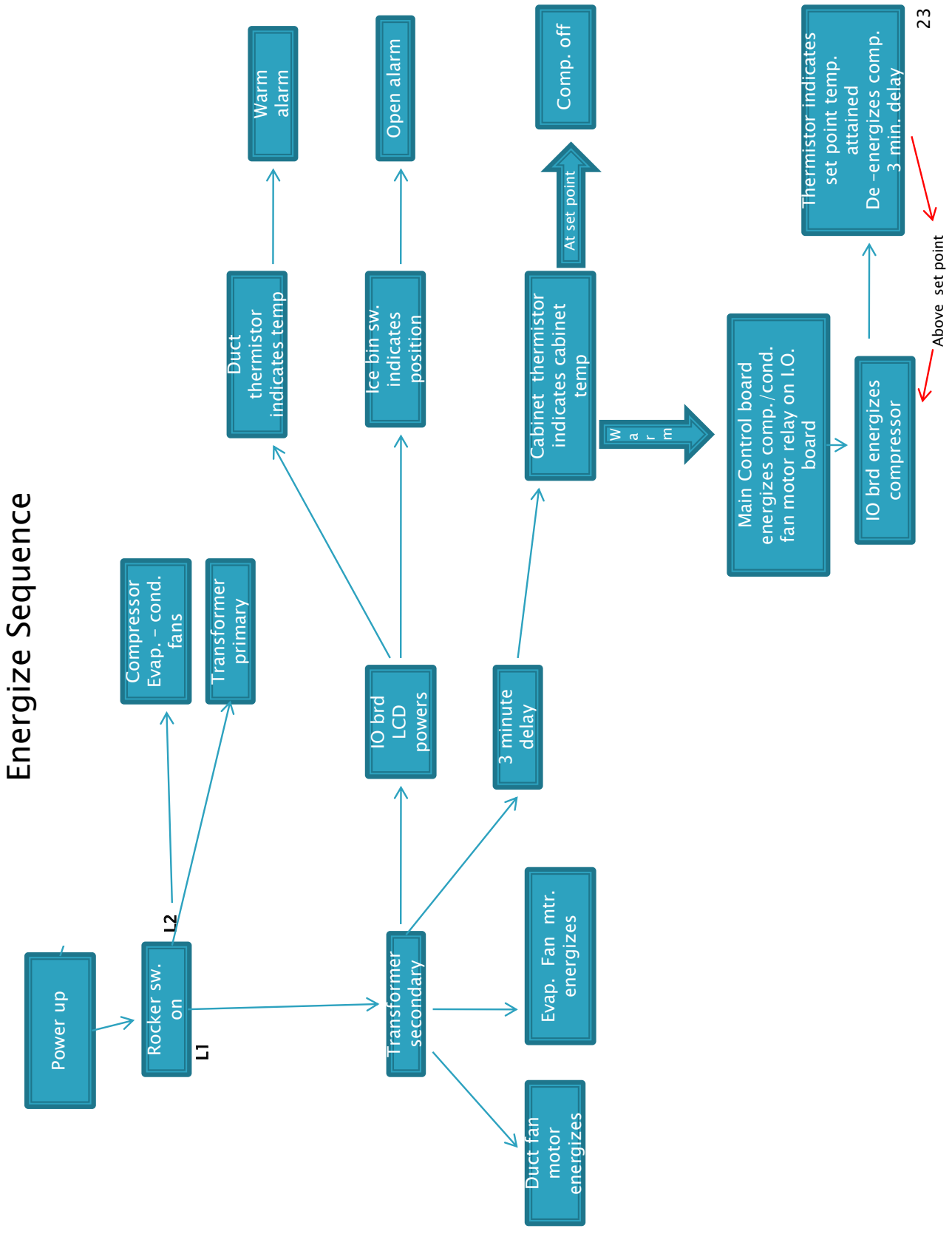
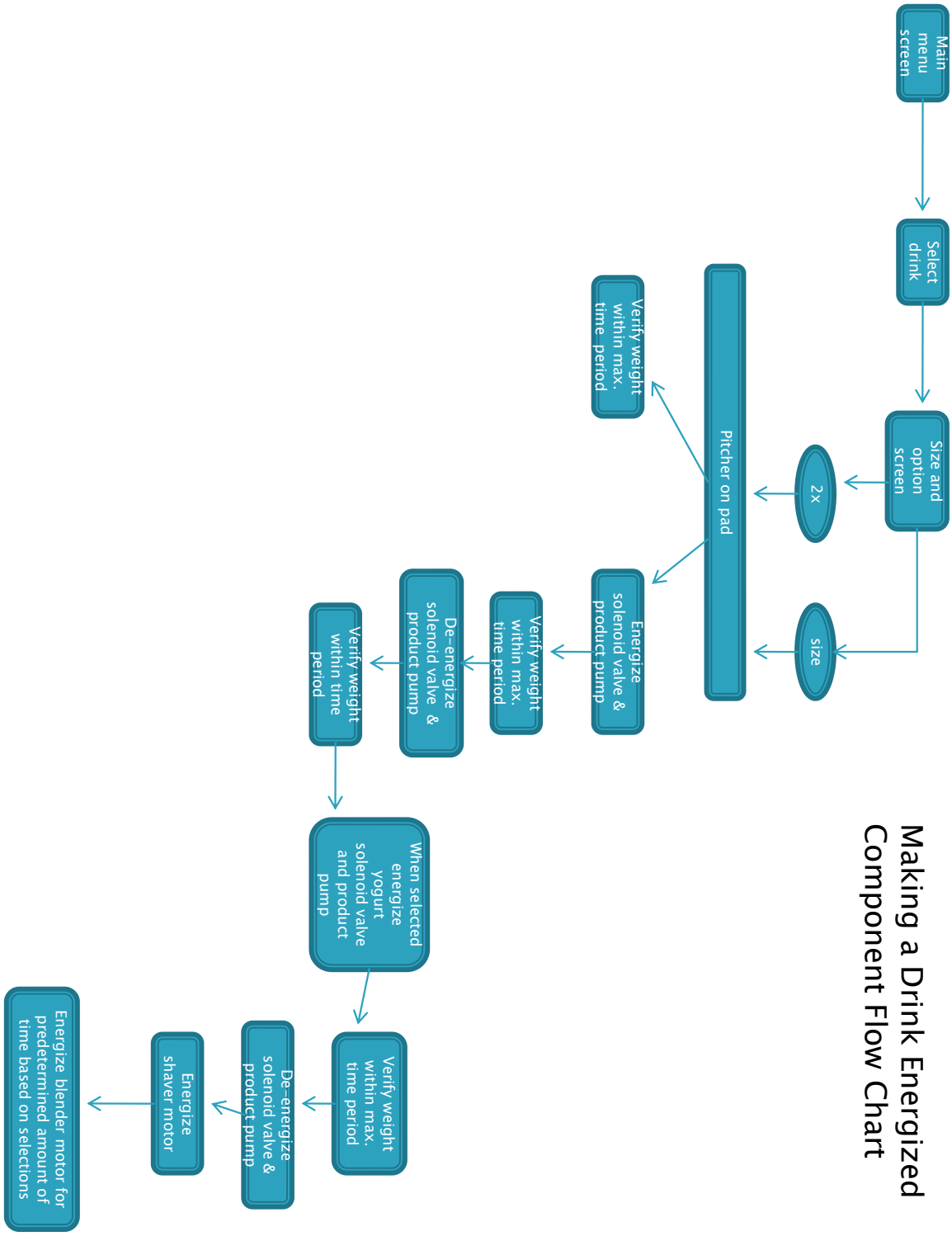


Figure D. Blade Replacement Kit

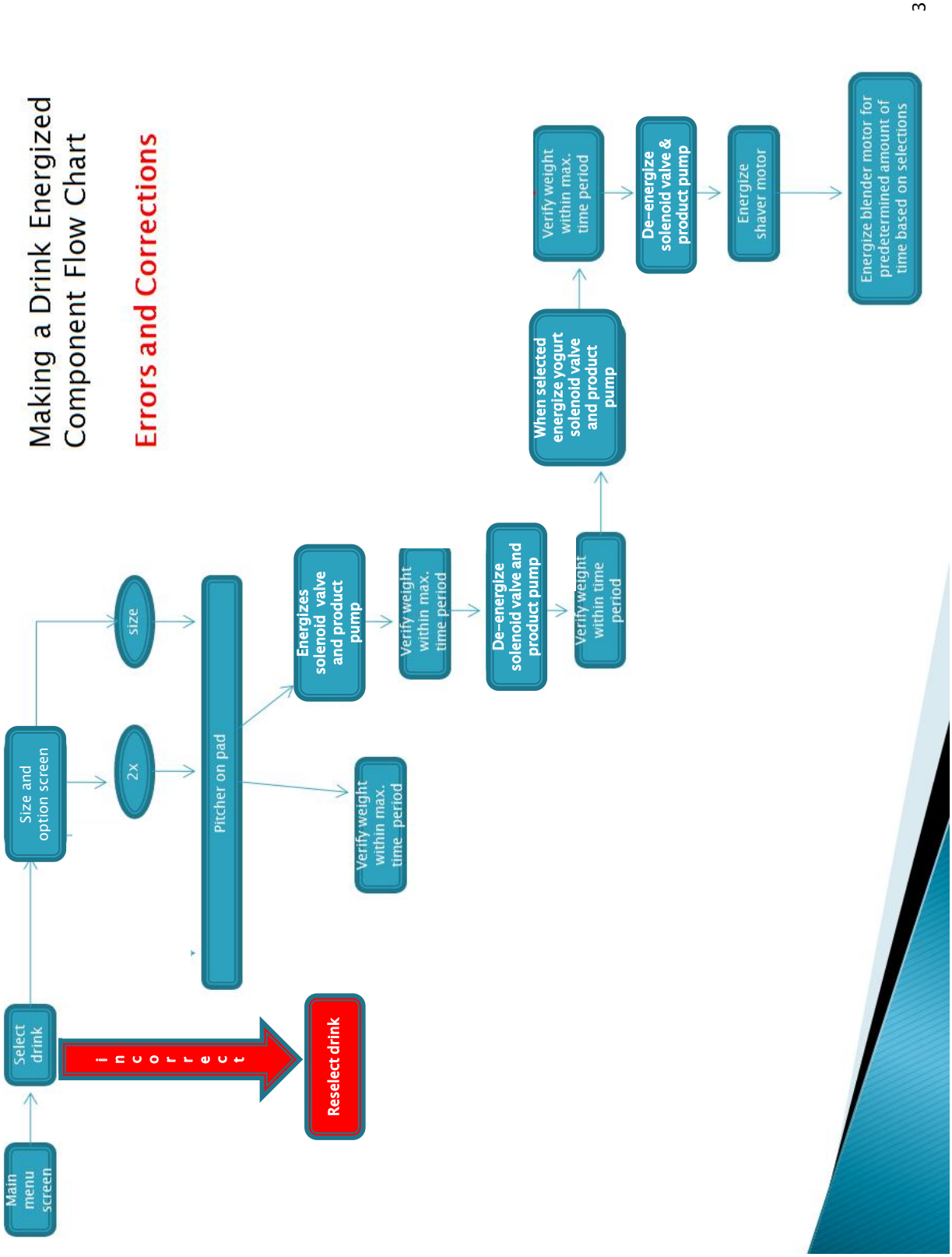
Energize Sequence Flowchart



Make a Drink Energized Component Flowchart

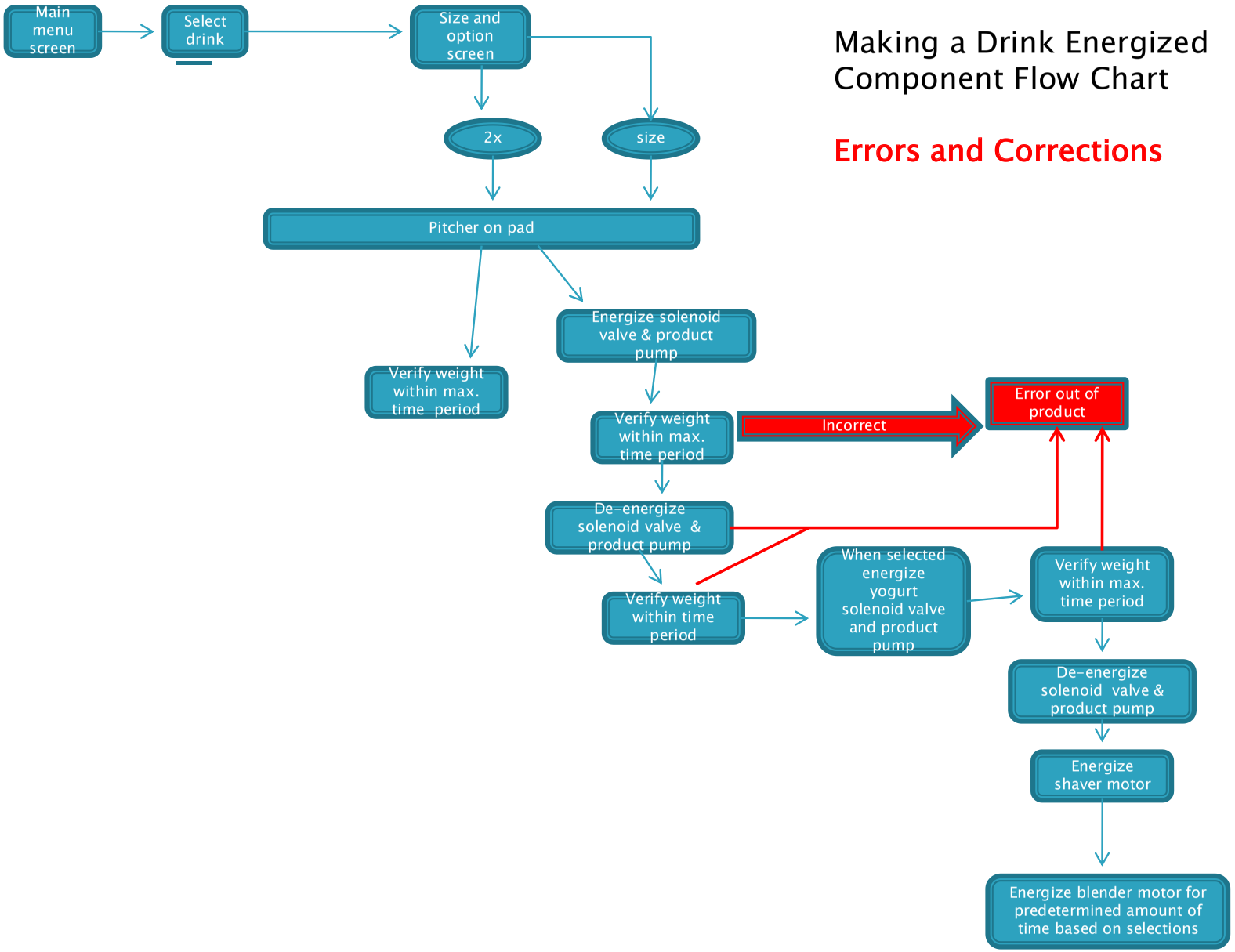

Making a Drink Energized Component Flow Chart
Main menu screen
Select drink
Size and option screen
2x
size
Pitcher on pad
Verify weight within max. time period
Energize solenoid valve & product pump
Verify weight within max. time period
De-energize solenoid valve & product pump
Verify weight within time period
When selected energize yogurt solenoid valve and product pump
Verify weight within max. time period
De-energize solenoid valve & product pump
Energize shaver motor
Energize blender motor for predetermined amount of time based on selections

2

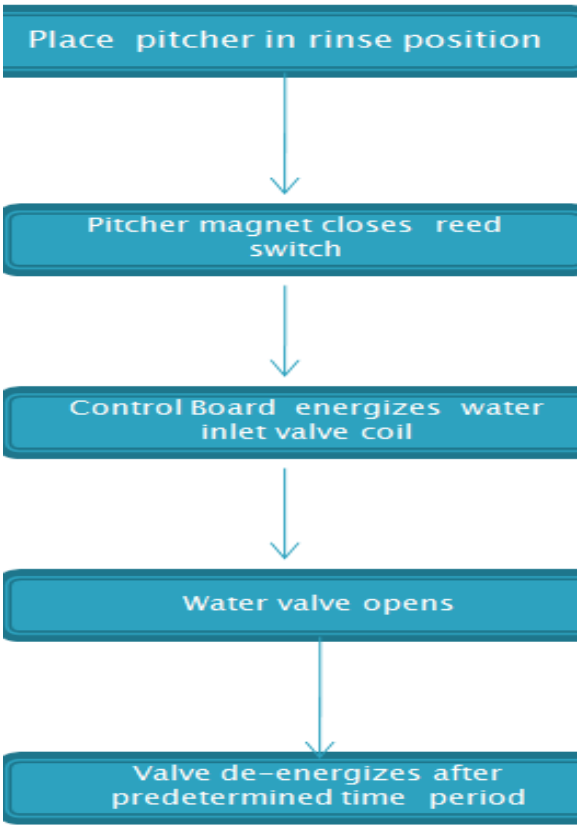

Making a Drink Energized Component Flow Chart
Errors and Corrections
Main menu screen
Select drink
incorrect
Reselect drink
Size and option screen
size
2x
Pitcher on pad
Verify weight within max. time period
Energizes solenoid valve and product pump
Verify weight within max. time period
De-energize solenoid valve and product pump
Verify weight within time period
When selected energize yogurt solenoid valve and product pump
Verify weight within max. time period
De-energize solenoid valve & product pump
Energize shaver motor
Energize blender motor for predetermined amount of time based on selections

Making a Drink Energized Component Flow Chart

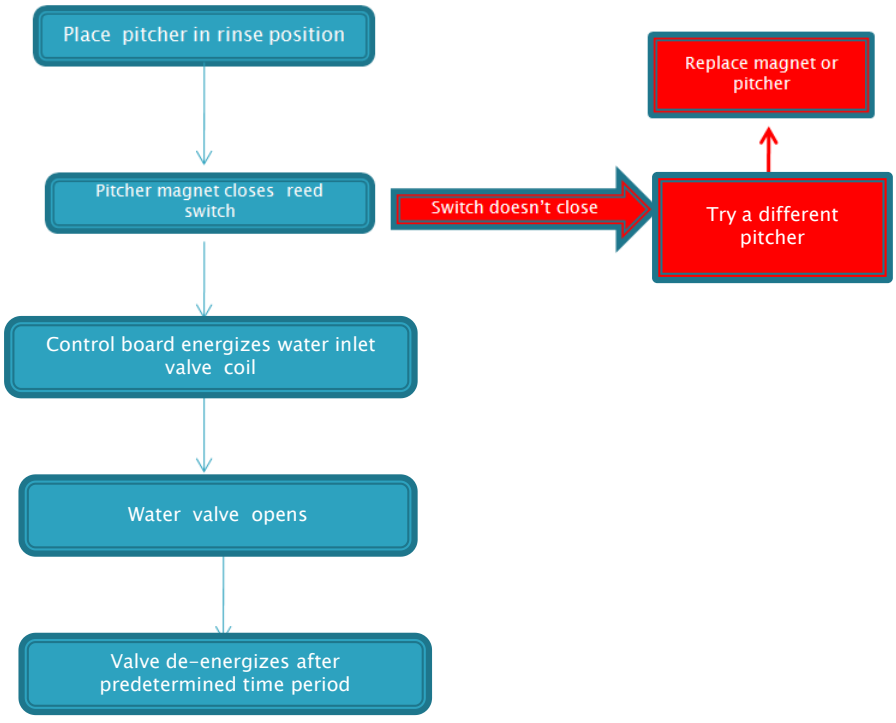
Errors and Corrections


Main menu screen
Select drink
Size and option screen
2x
size
Pitcher on pad
Verify weight within max. time period
Energize solenoid valve & product pump
Verify weight within max. time period
Incorrect
Error out of product
De-energize solenoid valve & product pump
Verify weight within time period
When selected energize yogurt solenoid valve and product pump
Verify weight within max. time period
De-energize solenoid valve & product pump
Energize shaver motor
Energize blender motor for predetermined amount of time based on selections

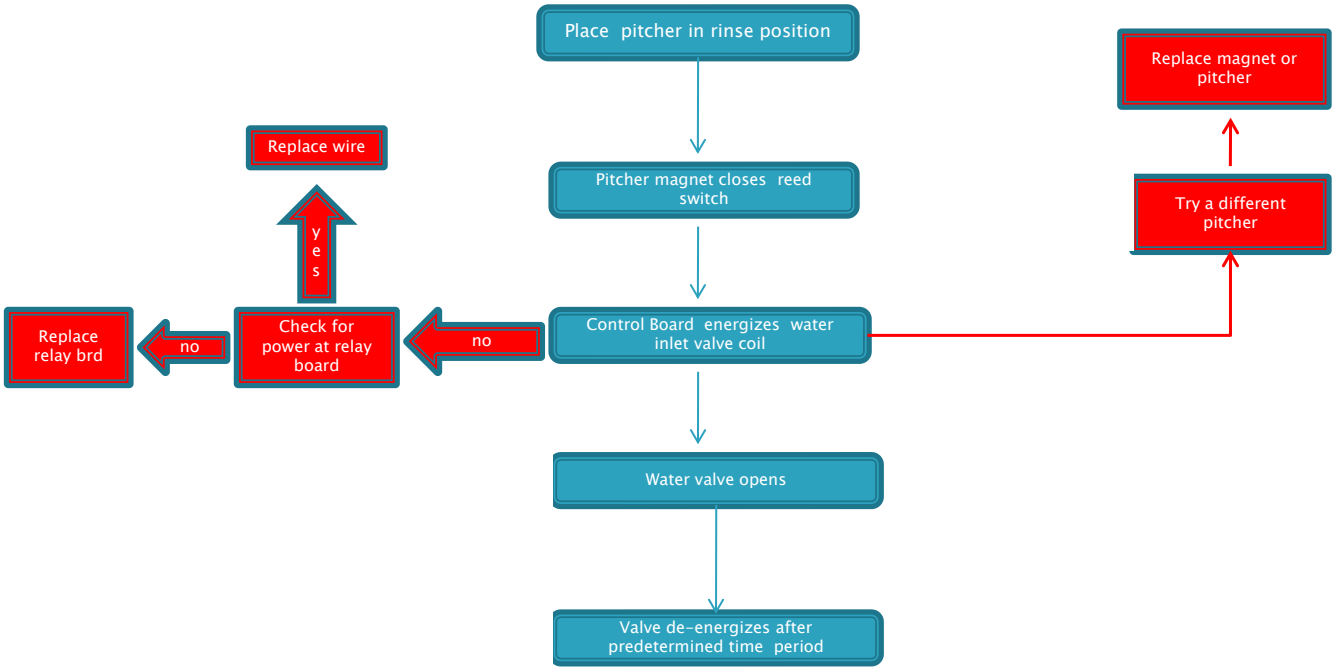
Rinsing Energized Flow Chart

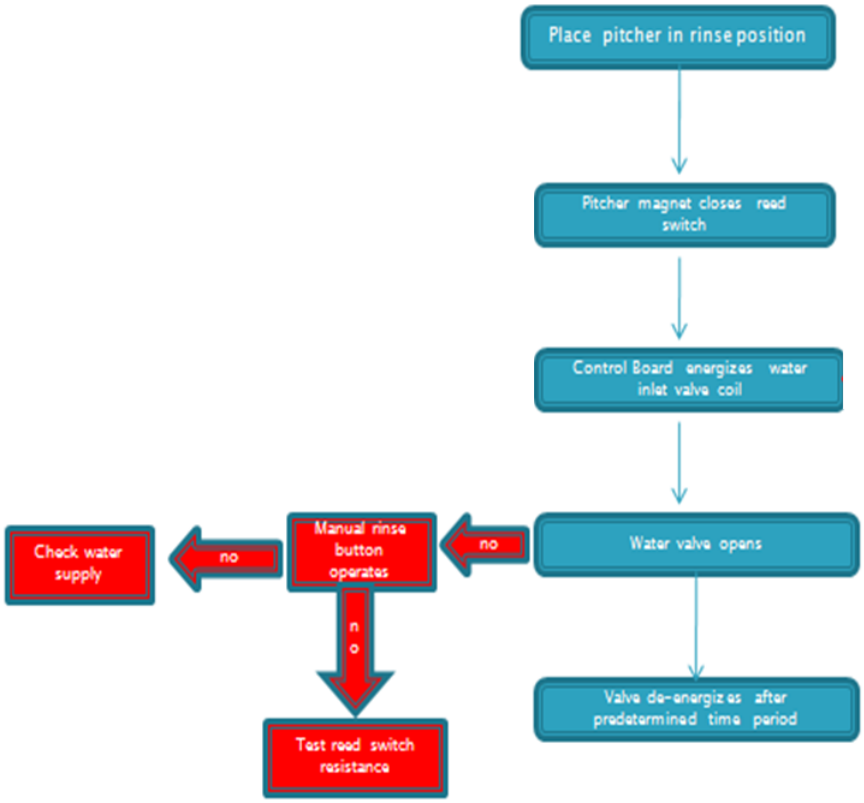

Place pitcher in rinse position
Pitcher magnet closes reed switch
Control Board energizes water inlet valve coil
Water valve opens
Valve de-energizes after predetermined time period

Rinsing Energized Flow Chart and errors / corrections


Place pitcher in rinse position
Pitcher magnet closes reed switch
Switch doesn't close
Replace magnet or pitcher
Try a different pitcher
Control board energizes water inlet valve coil
Water valve opens
Valve de-energizes after predetermined time period

Rinsing Energized Flow Chart and errors / corrections





Manager's Menu Screen

After selecting Managers Menu, the pass code screen appears.

Limited Managers password is 3312.

The screen features:

- Upload New Menu and Recipe Data
- F/C Temperature Units
- Update System Parameters
- Return

Full Managers password is 71360.

The screen features:

- Date and Time Settings
- Refrigeration Settings
- Valid Weight Ranges
- Specific Product Settings
- Ice Dispense Settings
- Water Dispense Settings
- Cleaning Process Settings
- Service Intervals
- Return

Reset functions password is 93078.

The screen features:

- Reset Inventory
- Reset Hardware History
- Reset Date of Manufacture
- Reset System Parameters
- Reset Born on Date
- Reset Cleaning Timer

Service password is 89531.

The screen features:

- Update System Parameters
- Scale Calibration
- Periodic Maintenance
- Fault and Diagnostic History
- Input/Output Test
- Smart Equipment Commission
- Return

Factory Service password is 54221.

The screen features:

- Asset and Operation History
- System Parameters
- Blender Motor Replaced
- Shaver Motor Replaced
- Blender Spindle Replaced
- Blender Control Replaced
- Blender Control Fan Replaced
- Scale Beam Replaced
- Compressor Replaced
- Install New Firmware
- Return

Centering Scale Instructions

1. Remove drive coupler.
2. Loosen plate.
3. Center drive coupler to plate.
4. Tighten plate screws.

Troubleshooting

Display Assembly

Symptom:	Potential Cause:	Remedy / Checks:
Display Does not turn on.	No Power Improper / Disconnected Power Wiring I/O Board Display Assembly	1. Verify that the machine is plugged into a working outlet that is rated for the machine. 2. Verify that the power switch is ON. 3. If the power switch is ON, verify that LED17 and LED 18 of the I/O board are ON, and LED15 (MICROPROCESSOR) is ON-Flashing. 4. If ALL LEDs are off, remove AC power and verify the wiring/connection to the 24VAC connector (J19) on the I/O board. This includes the main power switch, and the 120/24VAC power transformer. **Caution! High voltage! Be sure to disconnect power to the machine before servicing!** 5. If possible, measure the 24VAC input to the I/O board. 6. If the 24VAC input is good, replace the I/O board. 7. If the 24VAC input to the I/O board is bad, Measure the voltages at the transformer. 8. If the 120VAC input is good, and the 24VAC output is bad, replace the transformer. 9. If there is no 120VAC to the transformer, verify 120VAC at outlet. 10. If there is 120VAC to outlet, replace main power switch. 11. If the LED17 and LED18 are ON, and LED15 is OFF, check the ribbon cable connection to the I/O board. 12. If the ribbon cable connection to the I/O board is good, the cable may have come disconnected inside the display enclosure. Replace the Display Assembly. 13. If LED17 and LED18 are ON, LED 15 is flashing, and the display is not ON, the display may have become disconnected inside the Display Assembly. Replace the Display Assembly.
The Display turns on and does not respond to touches.	Touch-screen Display Bad / Disconnected Touch-screen Display not seated in enclosure correctly. Something is activating the touch-screen.	1. Ensure that there is nothing on or resting against the display. ***Note: Issues with the touch-response require that the Display Assembly is returned for service**. 2. Replace the Display Assembly.
Spots on the display, or display not as expected.	Dirty Display	1. Follow the cleaning instructions for the machine. ***Note: Care should be taken not to spray the display directly or to over-saturate the display with fluid as this may damage the display.**
	Display Bad / Compromised.	1. If there are spots or artifacts associated with the operation of the display, the display is bad and the Display Assembly needs to be replaced.
Cannot update Application Software via USB Flash Drive.	Application Software on the USB Flash drive is non-existent, wrong format, or corrupt. Incompatible flash drive.	1. Verify that the files on the USB Flash drive are correct. There should be two files in the root directory (eg. “F:” when viewing the USB Flash Drive on a PC.) File 1: “**firmware.S19**” File 2: “**mfscrc.txt**” (or “**mfscrc**” if the extension is hidden). 2. These files MUST be labeled as above, and they MUST be paired from the released code revision. ***Note: These files are paired in the released Application Software .zip file. In order to ensure that they are paired, you will have to get the files from the Application Software .zip file.*** 3. If the files are correct, try to load the files with a different USB Flash Drive. 4. If the code will not load, replace the Display Assembly.

Blender and Scale

Symptom:	Potential Cause:	Remedy / Checks:
Blender Communication Error: *"Communication Lost With Blender. Reset Power to Machine"* *"Lost Connection with Blender – Restart Machine"*	No Power to Blender Control Blender Cable / Connection Blender Control Board I/O Board Display Assembly	***Note: If the blender communication is good, LED14 on the I/O board will be ON.*** 1. Check power connections to Blender Control 2. Check serial cable connection between blender control and I/O board. 3. If the connection is good, replace the serial cable. 4. If possible, check the serial communication to a separate blender control. 5. If the error is removed with separate Blender Control, replace the Blender Control on unit. 6. If the error remains, replace the I/O board. 7. If the error remains, replace the Display Assembly.
Blender not spinning.	Stuck / Jammed Blender Blend Container Bad Blender	1. Remove the blend container from the scale. 2. Ensure that the blades of the blend container rotate freely. 3. If the blades do not rotate, remove the obstruction or replace the blend container. 4. If the blend container is good, ensure that there is nothing obstructing the operation of the blender mechanism. 5. From the startup screen, select [Menu] à [Managers Menu]. 6. Enter code "**89531**". 7. Select [Test I/O]. 8. Select [Blender Ramp]. 9. If the blender does not respond, replace the blender assembly.
Scale Reading Wrong • *"Blend Container Not in Place"* • *"Check Blend Container and Pad. Valid Container weight exceeded."*	Scale out of calibration / not calibrated	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Calibrate Scale]. 4. Follow the on-screen directions exactly to complete calibration. ***Note: For best results, ensure that the water used for calibration is measured accurately.***
	Scale not accurate / bad.	1. Ensure that there is nothing on the scale or affecting the operation of the scale. 2. From the startup screen, select [Menu] à [Managers Menu]. 3. Enter code "**89531**". 4. Select [Test I/O]. 5. Place an empty pitcher on the scale. 6. Ensure that the pitcher is positioned on the scale correctly. 7. Record the "Scale weight". _____ 8. Measure 8 oz of water and add it to the pitcher. 9. Record the "Scale weight". _____ 10. Subtract the pitcher weight from the pitcher weight with 8oz of water. _____ 11. Verify that the resulting weight is 8 oz ± 0.5 oz. 12. If the weight is not as expected, re-calibrate the scale. 13. If, after the second try, the scale is still wrong, replace the scale beam assembly.

Cooling

Symptom:	Potential Cause:	Remedy / Checks:
Cabinet Temperature Low / Product Freezing	Faulty Temperature Thermistor	1. See Product/Cabinet Thermistor debug section.
	Compressor not turning off I/O Board	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Test I/O]. 4. The compressor relay should be OFF. 5. If the compressor is still ON, verify that LED1 on the I/O board is OFF. 6. Verify operation of the compressor relay by cycling the relay control on and off several times. *If the relay is good, the relay activation will have an audible "click".* 7. If the LED is cycling ON and OFF, but the relay is not 'clicking' replace the I/O board.
Product Temperature High, cabinet temperature good. • *"*High Temperature Alarm*"*	Faulty Temperature Thermistor	2. See Product/Cabinet Thermistor debug section.
	Duct fan obstructed /not operating I/O Board	1. The duct fan should be ON in all modes of operation. 2. Apply power to the Smoothie Machine. 3. Open the cabinet door and observe the duct fan (upper right at the rear of the cabinet). 4. Verify that the duct fan is not obstructed. 5. If the duct fan is OFF, check the connections from the duct fan to the I/O Board, J8. 6. If the connections are good, replace the duct fan.

Cabinet / Product Thermistors

Symptom:	Potential Cause:	Remedy / Checks:
High/Low Product or Cabinet temperature reading. • *"Product Sensor Open Failure"* • *"Product Sensor Short Failure"* • *"Cabinet Sensor Open Failure"* • *"Cabinet Sensor Short Failure"*	Faulty Temperature Thermistor Bad or loose wiring I/O Board Display Assembly	1. From the startup screen, select [Menu] à [Inventory] 2. Record the reading for the product thermistor and the cabinet thermistor. • An open thermistor will read -20. • A shorted thermistor will read 140. 3. Check the connections to the I/O board. 4. If the connections are good, swap the cabinet thermistor and the product thermistor connections on the I/O board. 5. If the problem (open/short/high reading/low reading) follows the thermistor, replace the faulty thermistor. (Be sure to connect the correct thermistor to the correct connector.) 6. If the problem remains on either the cabinet or product reading, replace the I/O board.

Ice Shaver / Ice Bin Cover

Symptom:	Potential Cause:	Remedy / Checks:
Ice Shaver does not activate • *"Not Enough Shaved Ice in Container Drink Preparation Paused* *Fill Ice Bin or Clear Ice Passageway"*	Ice Bin Lid not in place.	1. Ensure that the Ice Bin Lid is positioned properly on the Ice Bin. 2. See "Ice Bin Lid" for debugging Ice Bin Lid issues.
	Ice Shaver breaker tripped.	1. Check the breaker at the rear of the machine. 2. Ensure that the Ice Shaver is not jammed. 3. Reset the breaker if necessary.
	Ice Shaver motor bad. I/O Board bad.	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Test I/O]. 4. Ensure the "Ice Bin Cover" is ON when the cover is in place. 5. Turn ON the shaver motor. 6. If the shaver motor does not turn on, Check LED3 on I/O board. 7. If LED 3 is ON, and the shaver is not operating, remove power to the system and check wire connections to the shaver motor. **Caution! The Shaver Motor wiring is high voltage! Be sure to disconnect power to the machine before servicing!** 8. If the connections are good, replace shaver assembly 9. If LED 3 is OFF, replace I/O board
Ice Bin Lid: • *"Ice bin lid not in place. Secure ice bin cover to restore operation"*	Ice Bin Switch Bad / Stuck	1. Secure the Ice bin Lid. 2. If the lid is secure, and the error does not go away, remove the lid and attempt to activate the SW using a screwdriver or a flat, dull knife. 3. While attempting to activate the switch, listen and feel for the switch activation. 4. If the mechanical operation of the switch is bad, Replace the switch or switch components. 5. If the switch seems like it's activating, but the error is not removed, check the switch connection to the I/O board. 6. If the connection is good, check the operation of the I/O board.
	Cable connection to I/O board bad.	1. Check the switch connection to the I/O board. 2. If the connection is good, check the operation of the I/O board.
	I/O Board	1. Cycle power to the system to remove the error message and enter the Service Menu 2. From the startup screen, select [Menu] à [Managers Menu]. 3. Enter code "**89531**". 4. Select [Test I/O]. 5. Remove the cable connector from J3 (ICE COVER) of the I/O Board. 6. Using a piece of or wire, short pin 1 to pin 3 of J3. 7. Verify that while the short is applied, the display indicates that the Ice Cover is ON. 8. If the display indicates that the Ice Cover is still OFF, replace the I/O Board. 9. If the display indicates that the Ice Cover is ON, replace the Ice Cover switch.

Product Dispensing

Symptom:	Potential Cause:	Remedy / Checks:
Product Not Dispensing: • *"Drink Making Paused"* • *"Check Hose at Pump Location"* • *"Product dispense fault – Check Product Pomp Lines and Nozzle"*	Air line disconnected Insufficient air pressure Regulator Bad	1. Verify that a pressurized air line is connected to the air inlet on the back of the system. 2. Verify that the air regulator at the rear of the machine is between TBD and TBD psi. 3. If the Air Line to the system is good, and the regulator is not reading air pressure, replace the regulator.
	Solenoid Valve Bad or wiring disconnected / bad. I/O Board	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Test I/O]. 4. While listening inside the cabinet, turn the suspect valve ON. *The valve will make an audible "click" when activated.* 5. If the valve does not activate, ensure that the wiring to the valve is correct. 6. Check the relay operation on the I/O board. *If the relay is good, the relay activation will have an audible "click" and the corresponding LED will be ON.* 7. If the relay is good, and the wiring is good, replace the solenoid valve. 8. If the relay does not activate, replace the I/O board.
	Product tubing obstruction	1. Follow the maintenance procedures for clearing an obstruction.

Rinsing and Water Dispensing

Symptom:	Potential Cause:	Remedy / Checks:
Blend Container Rinse does not activate	Water is not connected or turned on. Ensure water is connected and turned ON (water pressure gauge)	Turn on the water source and ensure that all water connections are tight. Ensure that the water pressure is above 30 psi.
	Blend container is not properly positioned over the rinse mechanism or improper blend container being used.	Ensure that blend container (with embedded magnet) is positioned properly over the rinse mechanism.
	Reed Switch	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Test I/O]. 4. Ensure the "Rinse Reed Switch" is ON when the blend container is present. 5. If the "Rinse Reed Switch" is OFF, ensure that the blend pitcher is properly positioned. 6. Check the connection from the Reed Switch to J4 of the I/O board. 7. If the connection is good, replace the reed switch.
	Rinse Valve Bad / Stuck	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Test I/O]. 4. With the "Rinse Reed switch" ON, from the service screen, turn on the "Rinse Solenoid". 5. If no water, ensure that LED4 of the I/O board is ON. 6. If LED is ON, check cable connection to rinse valve. 7. If the connections are good, replace the valve.
	I/O Board	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Test I/O]. 4. With the Hall Effect switch ON (blend container present), turn on the "Rinse Solenoid". 5. Verify that LED4 on the I/O board is ON. 6. If the LED does not activate, replace the I/O board.
Manual Water dispense does not activate. (Service Menu Only)	Water is not connected or turned on. Ensure water is connected and turned ON (water pressure gauge)	Turn on the water source and ensure that all water connections are tight. Ensure that the water pressure is above 30 psi.
	Water Valve Bad / Stuck	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Test I/O]. 4. Turn on the "Water Solenoid". 5. If no water, ensure that LED5 of the I/O board is ON. 6. If LED is ON, check cable connection to water valve. 7. If the connections are good, replace the valve.
	I/O Board	1. From the startup screen, select [Menu] à [Managers Menu]. 2. Enter code "**89531**". 3. Select [Test I/O]. 4. Turn on the "Water Solenoid". 5. Verify that LED5 on the I/O board is ON. 6. If the LED does not activate, replace the I/O board.

Refrigeration Operation

Default temperature setpoint = 36° F with a 4° F Differential

Normal Operation

The microprocessor control board controls the cabinet temperature based on the input received from the cabinet temperature thermistor. The thermistor value is compared to the control board setpoint. When the reach-in temperature is equal or greater than the setpoint (plus half the differential) the compressor relay closes provided the following conditions are satisfied:

1. Power has been uninterrupted to the control board for a 3 minute period.

OR

1. The 3 minute compressor time delay has expired. The delay period starts after the compressor has run and then cycles off.
2. The blender motor is off - If the blender motor is operating the compressor relay closes when the blender motor stops (provided # 1 above is true).

The compressor relay opens when the reach-in temperature is less than the setpoint (minus half the differential).

Evaporator and Condenser Fan Motor Operation

The condenser fan motor and compressor share the same relay. The evaporator fan motor relay is energized continuously and the evaporator fan cycles off only during cleaning cycle.

Operation in the Clean/Sanitize cycle

During the weekly cleaning/sanitize cycle the evaporator fan motor relay and the condenser fan motor/ compressor relay are de-energized. The relays cannot energize until the clean/sanitize cycle is complete. Upon completion of the clean/sanitize cycle the relays will energize provided the conditions listed in normal operation are satisfied.

Maximum Compressor Run Time

After 180 minutes of cumulative compressor run time, the compressor will be de-energized for fifteen (15) minutes.

High Temp Alarm

High temp alarm will display when product thermistor is above 42ºF for 30 minutes and following conditions are satisfied

3 hours since power is applied

1 hour since cleaning cycle

Error display will reset when temperature reaches 41ºF or below**.**

Thermistor Failure

If the microprocessor control board receives an open or shorted cabinet thermistor signal the following will happen:

1. A fault is displayed on the LCD screen sensor

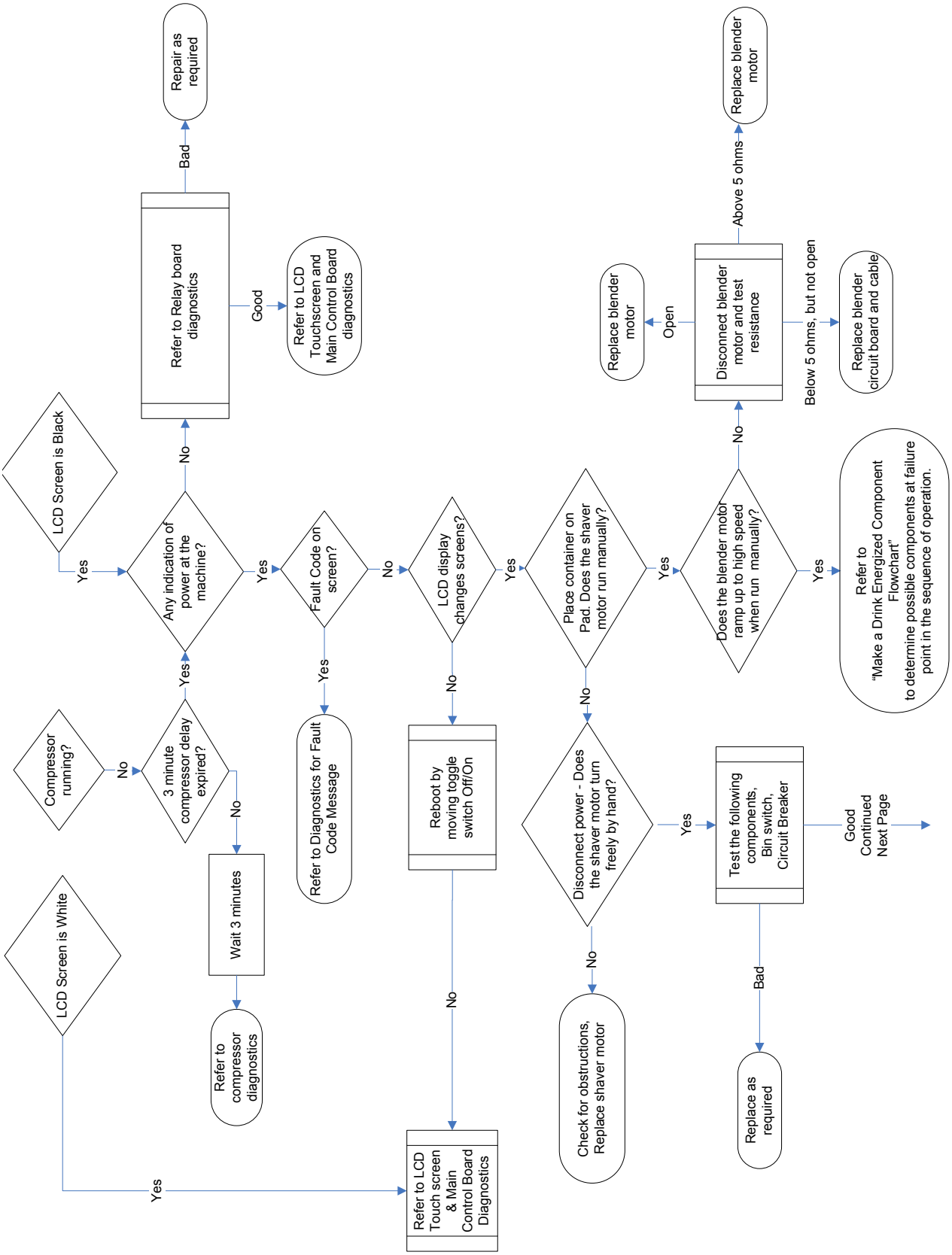
- Cabinet sensor open

OR

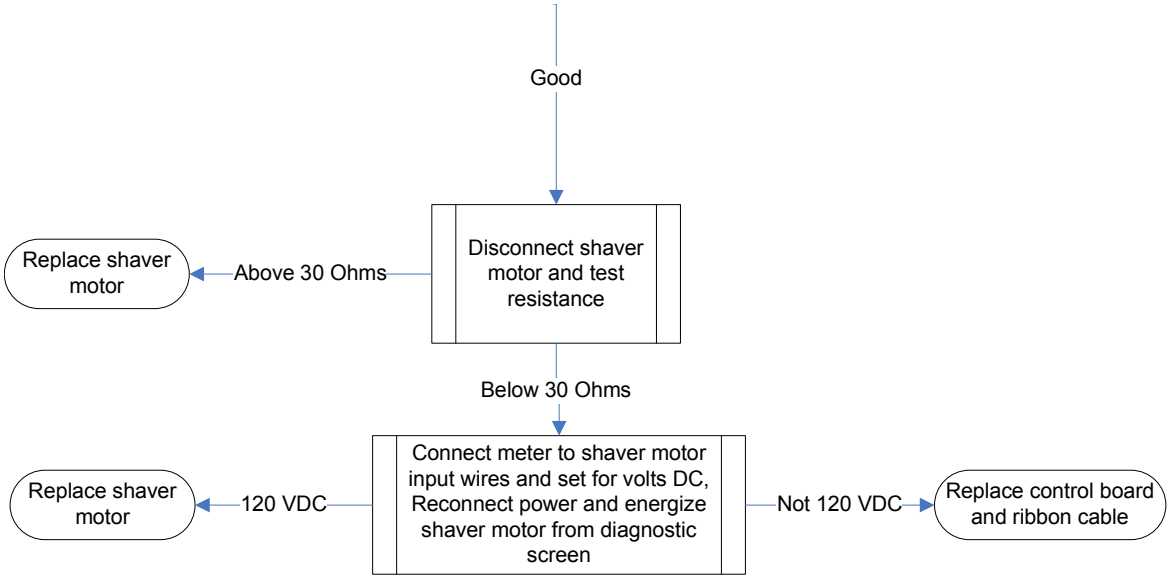
- Cabinet sensor shorted

1. The microprocessor will initiate a default sequence for the refrigeration system - 12 minutes on, 3 minutes off.
2. The default cycle continues until the fault is corrected or power is disconnected. Refer to Cabinet Temperature Thermistor for diagnostic procedures.

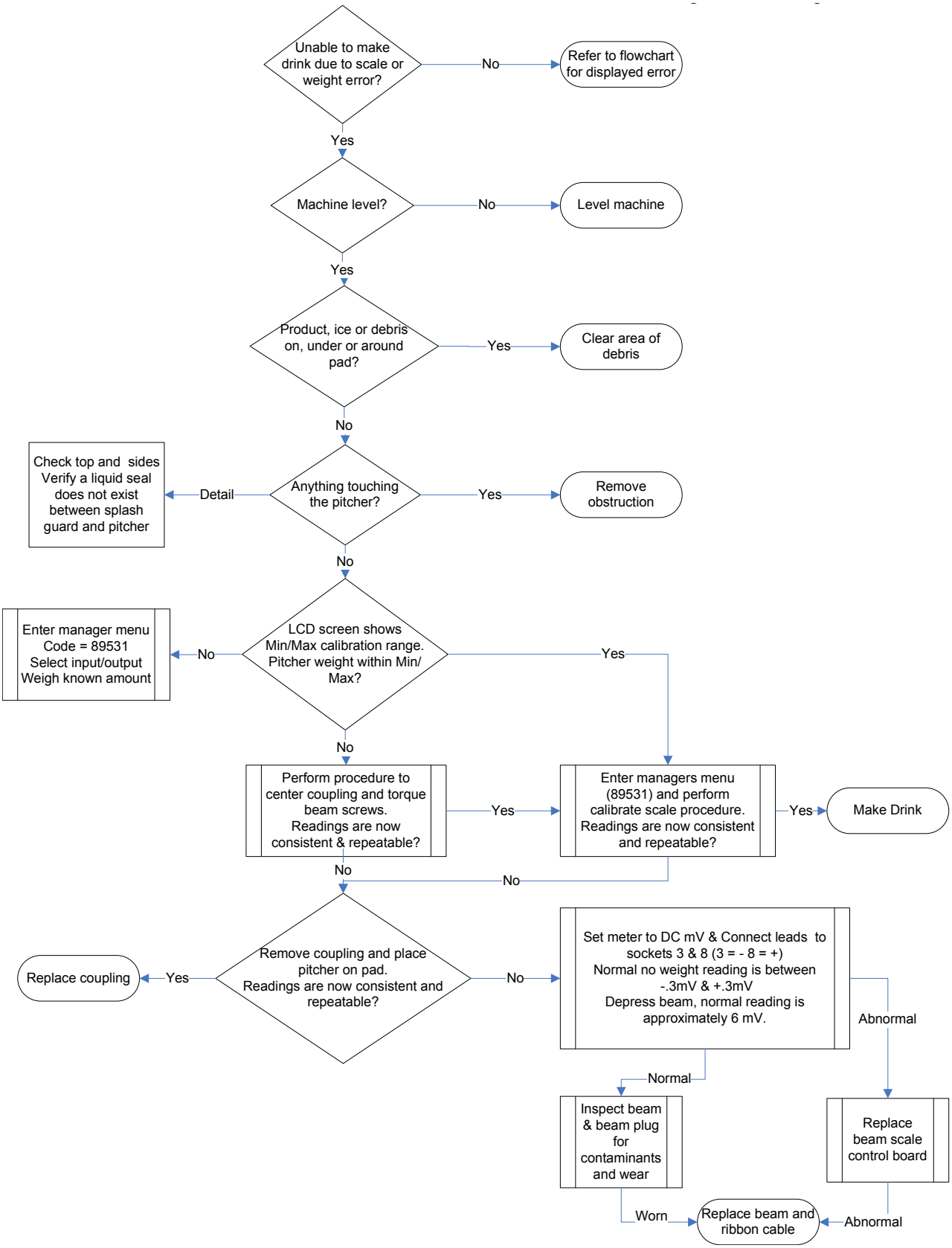
Will Not Run Flowchart



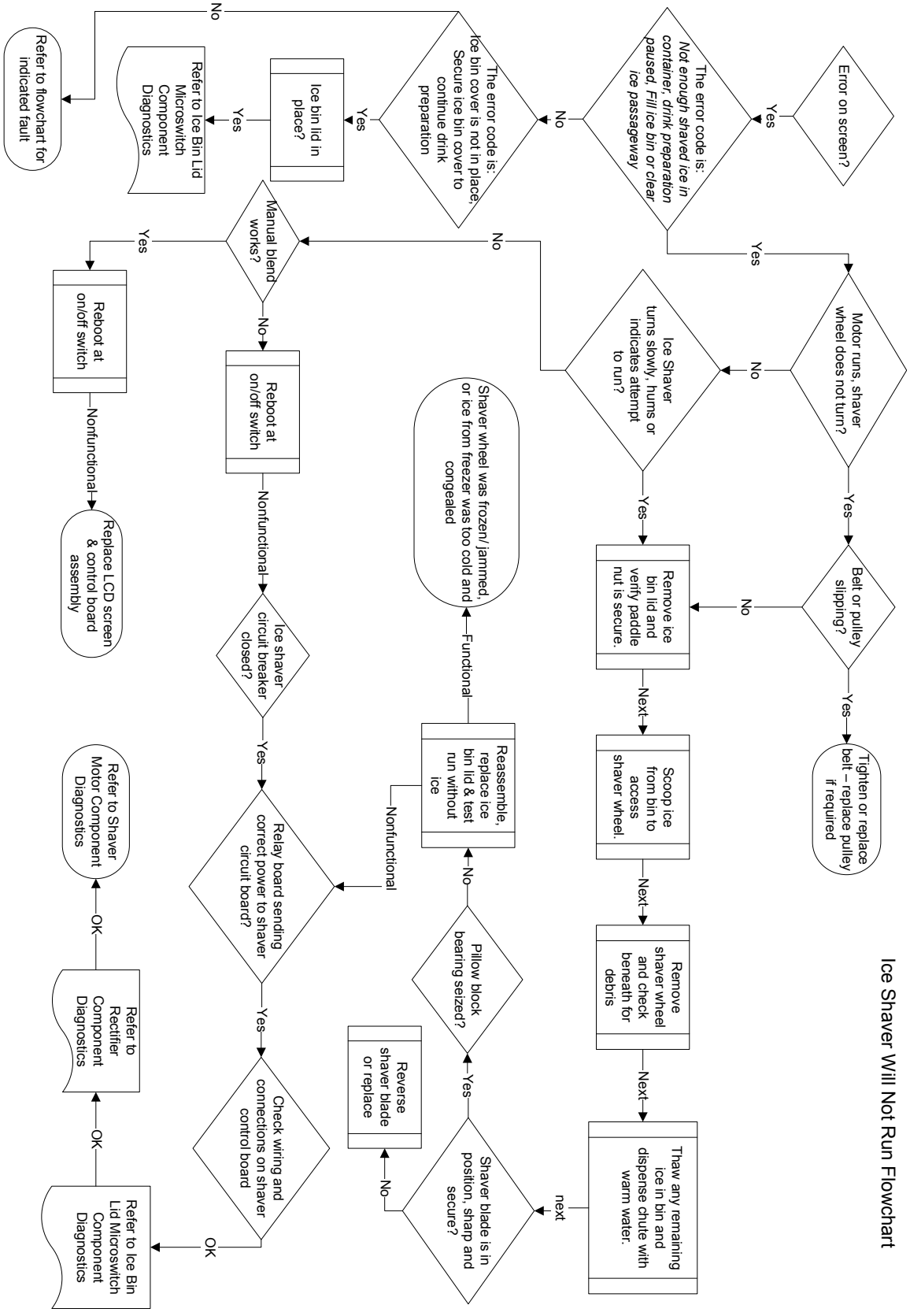
Will Not Run Flowchart, continued


Good
Disconnect shaver motor and test resistance
Above 30 Ohms
Replace shaver motor
Below 30 Ohms
Connect meter to shaver motor input wires and set for volts DC, Reconnect power and energize shaver motor from diagnostic screen
120 VDC
Replace shaver motor
Not 120 VDC
Replace control board and ribbon cable

Weight Beam Diagnostic Flowchart


Unable to make drink due to scale or weight error?
No
Refer to flowchart for displayed error
Yes
Machine level?
No
Level machine
Yes
Product, ice or debris on, under or around pad?
Yes
Clear area of debris
No
Check top and sides Verify a liquid seal does not exist between splash guard and pitcher
Detail
Anything touching the pitcher?
Yes
Remove obstruction
No
Enter manager menu Code = 89531 Select input/output Weigh known amount
No
LCD screen shows Min/Max calibration range. Pitcher weight within Min/ Max?
Yes
No
Perform procedure to center coupling and torque beam screws. Readings are now consistent & repeatable?
Yes
Enter managers menu (89531) and perform calibrate scale procedure. Readings are now consistent and repeatable?
Yes
Make Drink
No
No
Replace coupling
Yes
Remove coupling and place pitcher on pad. Readings are now consistent and repeatable?
No
Set meter to DC mV & Connect leads to sockets 3 & 8 (3 = - 8 = +) Normal no weight reading is between -.3mV & +.3mV Depress beam, normal reading is approximately 6 mV.
Abnormal
Normal
Inspect beam & beam plug for contaminants and wear
Replace beam scale control board
Worn
Replace beam and ribbon cable
Abnormal

Ice Shaver Will Not Run Flowchart


Ice Shaver Will Not Run Flowchart
Error on screen?
Yes
The error code is: Not enough shaved ice in container, drink preparation paused, Fill ice bin or clear ice passageway
No
The error code is: Ice bin cover is not in place, Secure ice bin cover to continue drink preparation
No
Refer to flowchart for indicated fault
Yes
Ice bin lid in place?
Yes
Refer to Ice Bin Lid Microswitch Component Diagnostics
Yes
Motor runs, shaver wheel does not turn?
Yes
Belt or pulley slipping?
Yes
Tighten or replace belt – replace pulley if required
No
Remove ice bin lid and verify paddle nut is secure.
Next
Scoop ice from bin to access shaver wheel.
Next
Remove shaver wheel and check beneath for debris
Next
Thaw any remaining ice in bin and dispense chute with warm water.
next
No
Ice Shaver turns slowly, hums or indicates attempt to run?
Yes
Shaver wheel was frozen/ jammed, or ice from freezer was too cold and congealed
Functional
Reassemble, replace ice bin lid & test run without ice
No
Pillow block bearing seized?
Yes
Reverse shaver blade or replace
No
Shaver blade is in position, sharp and secure?
Yes
Check wiring and connections on shaver control board
OK
Refer to Ice Bin Lid Microswitch Component Diagnostics
OK
Refer to Rectifier Component Diagnostics
OK
Refer to Shaver Motor Component Diagnostics
Nonfunctional
Relay board sending correct power to shaver circuit board?
Yes
Ice shaver circuit breaker closed?
Yes
Nonfunctional
Reboot at on/off switch
No
Manual blend works?
Yes
Reboot at on/off switch
Nonfunctional
Replace LCD screen & control board assembly

ON/OFF Rocker Switch

FUNCTION

The switch is used to energize and de-energize the Blended Ice Machine.

SPECIFICATIONS

Double-pole, Double-throw switch.

CHECK PROCEDURE

Use a voltmeter/ohm meter to check rocker switch operation.

1. Inspect the rocker switch for correct wiring.
2. Isolate the rocker switch by disconnecting the wiring connectors.
3. Check continuity across the rocker switch terminals.

Switch Setting	Meter Reading
ON	Closed
OFF	Open

1. Replace the rocker switch if continuity readings do not match both switch settings.

Transformer

FUNCTION

Reduces primary voltage to secondary voltage.

Steps down voltage from 120 or 230 VAC to 24 VDC.

SPECIFICATIONS

Steps down voltage from:

120/60/1 VAC to 24 VAC 75 VA

230/50-60/1 VAC to 24 VAC 75 VA

Normal Room Temperature or Recently De-energized Resistance:

Primary

120 VDC = 6 to 8 ohms

230 VDC = 3 to 5 ohms

Secondary

120 VDC = .3 to .5 ohms

230 VDC = .1 to 3 ohms

CHECK PROCEDURE

Use an ohmmeter to check operation. Deduct meter and lead resistance from final readings (short leads together to determine deduction value).

1. Inspect for correct wiring.
2. Isolate by disconnecting the wiring connectors.
3. Check primary winding resistance through terminals with an ohm meter.
4. Within resistance range = Transformer is good
5. Outside resistance range = Replace transformer
6. Open = Transformer fuse open, check for shorts to ground on secondary side and replace transformer.

Control Board Fuse

FUNCTION

The control board fuse stops Blended Ice Machine operation if electrical components fail, causing high amp draw.

SPECIFICATIONS

Rating 4A 250 volt slow blow.

CHECK PROCEDURE

1. If the LCD display is on, the fuse is good.

> **⚠ Warning**
> Disconnect electrical power to the entire Blended Ice Machine before proceeding

1. Remove the fuse. Check for continuity across the fuse with an ohmmeter.

Reading	Result
Open (OL)	Replace Fuse
Closed (O)	Fuse is Good

IO (Input/Output) Board

FUNCTION

Routes signals from sensors to the microprocessor control board.

Opens and closes relays based on the signals it receives from the microprocessor control board.

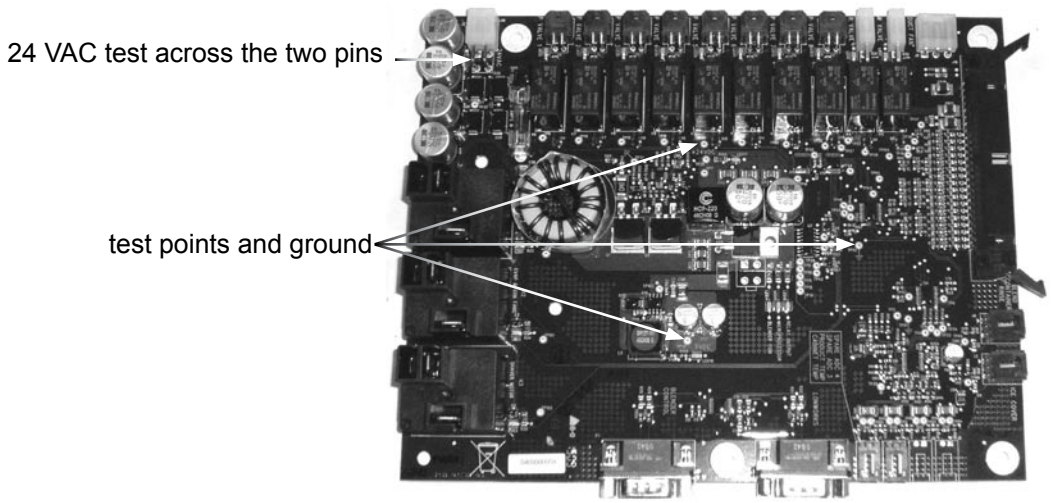
SPECIFICATIONS

24 VAC input

CHECK PROCEDURE

Refer to appropriate flowchart for the problem you are encountering. IO board diagnostics are covered by a process of elimination in the individual flow charts.

1. Reboot machine by moving toggle switch off/on
2. If the IO board has lights energized go to step 7.
3. Verify line voltage is present and the power switch is in the On position.
4. Verify primary voltage is present at the transformer primary.
5. Verify secondary voltage (24 VAC) is supplied to the IO board.
6. Verify the IO board fuse is good.
7. Verify 5 VDC at test locations on IO board.
8. Verify 24 VDC at test locations on IO board.



LCD Touchscreen & Microprocessor Control Board

FUNCTION

Touch screen is the user interface with the machine and sends input to the control board.

Microprocessor Control Board (MCB) monitors inputs and sends signals to the IO board to energize and de-energize components.

SPECIFICATIONS

The LCD touchscreen display and microprocessor control board are contained in one module.

CHECK PROCEDURE

1. Reboot machine by moving toggle switch off/on

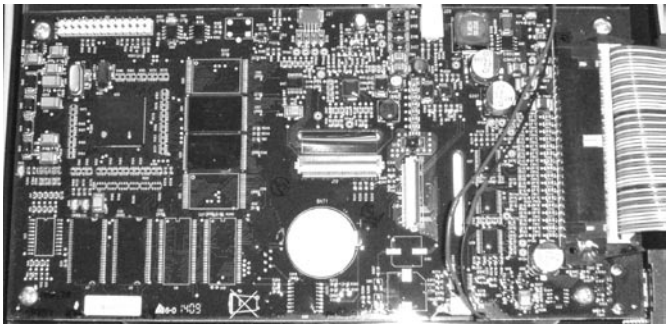
Refer to appropriate flowchart for the problem you are encountering. Touch screen and microprocessor control board diagnostics are covered by a process of elimination. Use the individual flow charts unless the LCD screen is entirely black (no power) or entirely white (powered).

Touch screen is black

- Verify processor board has energized lights - Refer to Will not Run flowchart for no lights.
- Verify touchscreen power connector is connected to control board.

Touch screen is white

- Verify strip connector is secure and connected by removing and reinserting connector.
- Lift lock
- Remove and evenly reinsert strip into connector.
- Depress lock to secure strip.
- Inspect strip to verify even placement.
- Replace touchscreen and control board assembly.



Cabinet Temperature Thermistor

FUNCTION

Supplies input to control board to indicate cabinet temperature. The control board energizes and de-energizes the compressor based on input from this thermistor.

SPECIFICATIONS

10,000 Ohms ± 2% at 25°C (77°F)

CHECK PROCEDURE

NOTE: Use a multimeter to check operation.

1. Reboot machine by moving toggle switch off/on.
2. Inspect for correct wiring.
3. Isolate by disconnecting the wiring connectors.
4. Check continuity across the terminals with an ohm meter.

- Resistance = Thermistor is good
- Open (OL) = Replace thermistor

NOTE: This thermistor is identical to the the duct temperature thermistor. Swapping the two thermistor connections at the IO board can be used for diagnostics.

Product Chase Temperature Thermistor

FUNCTION

Supplies input to control board to indicate chase temperature. The control board energizes error warning based on input from this thermistor.

SPECIFICATIONS

10,000 Ohms ± 2% at 25°C (77°F)

CHECK PROCEDURE

NOTE: Use a multimeter to check operation.

1. Reboot machine by moving toggle switch off/on
2. Inspect for correct wiring.
3. Isolate by disconnecting the wiring connectors.
4. Check continuity across the terminals with an ohm meter.

- Resistance = Thermistor is good
- Open (OL) = Replace thermistor

NOTE: This thermistor is identical to the the cabinet temperature thermistor. Swapping the two thermistor connections at the IO board can be used for diagnostics.

TEMPERATURE/RESISTANCE CHART

This chart is used for the product chase and temperature control thermistors. As the temperature rises at the thermistor block, the resistance drops.

If the ohmmeter reads “OL,” check the scale setting on the meter before assuming the thermistor is bad.

Temperature of Thermistor		Nominal Resistance
°C	°F	K Ohms (x 1000)
0° - 3°	32° - 37°	32.65 - 28.05
3° - 6°	37° - 43°	28.05 - 24.17
6° - 9°	43° - 48°	24.17 - 20.88
9° - 12°	48° - 54°	20.88 - 18.09
12° - 15°	54° - 59°	18.09 - 15.71
15° - 18°	59° - 64°	15.71 - 13.68
18° - 21°	64° - 70°	13.68 - 11.94
21° - 24°	70° - 75°	11.94 - 10.45
24° - 27°	75° - 80°	10.45 - 9.17
27° - 30°	80° - 86°	9.17 - 8.06

Chase Fan

FUNCTION

Moves cool air from the cabinet through the tubing chase to maintain cabinet temperature in the beverage lines.

SPECIFICATIONS

24 VDC 5 watt

CHECK PROCEDURE

1. Isolate by disconnecting the wiring connectors on the IO board.
2. Check continuity across the terminals with an ohm meter.

- Resistance = Motor is good
- Open (OL) = Replace motor

Evaporator Fan

FUNCTION

Circulates air across the evaporator and throughout the cabinet interior.

SPECIFICATIONS

120/60/1 .38 amp

CHECK PROCEDURE

1. Use an extendable mirror and flashlight to verify fan blade rotation.
2. Isolate suspect motor by disconnecting the wiring connectors.
3. Check continuity across the terminals with an ohm meter.

- Resistance = Motor is good
- Open (OL) = Replace motor

Condenser Fan

FUNCTION

Moves air across the condenser fins to provide heat transfer from the condenser coil to the air stream. This warm air is used to evaporate any evaporator condensate from the drain pan.

SPECIFICATIONS

CHECK PROCEDURE

1. Isolate by disconnecting the wiring connectors.
2. Check continuity across the terminals with an ohm meter.

- Resistance = Motor is good
- Open (OL) = Replace motor

Ice Bin Lid Microswitch

FUNCTION

Prevents operation of machine with ice bin lid removed. Two micro switches are used, one micro switch signals the control board to initiate a failure screen and the second micro switch prevents the shaver motor from running.

SPECIFICATIONS

Shaver Motor Switch - Inner switch

Control Board Input Switch - Outer switch

Normally Open, Single Throw

CHECK PROCEDURE

NOTE: Use a volt/ohm meter to check switch operation.

1. Inspect switch for correct wiring.
2. Isolate the switch by disconnecting the wiring connectors.
3. Check continuity across the switch terminals and refer to correct chart for switch.

Shaver Motor Switch Position	Meter Reading
Depressed	C - N/O =Closed
Released	C - N/O = Open

Control Board Input Switch Position	Meter Reading	
Depressed	C - N/C = Closed	C - N/O = Open
Released	C - N/C = Open	C - N/C = Closed

1. Replace the switch if continuity readings do not match both switch settings.

Product Pump

FUNCTION

Transfers product from bag to pitcher.

SPECIFICATIONS

Pressure operated, requires a minimum pressure of 40 PSIG. Maximum pressure is 90 PSIG.

CHECK PROCEDURE

1. Verify cabinet temperature is not below freezing. A frozen pump can be thawed and made operational.
2. Perform “clearing a blocked pump procedure”.
3. Verify pressure regulator setting is correct.
4. Verify pressure is present at product pump inlet.
5. Disconnect pressure inlet line and product inlet and outlet lines from product pump.
6. Point pump inlet/outlet away from face and reconnect inlet pressure line:

- Pump does not cycle - Replace pump.

Solenoid Valves

FUNCTION

Instantaneously stops flow of product through product tubing.

Shaver Motor

FUNCTION

Turns shaver wheel to supply shaved ice.

SPECIFICATIONS

Shaver motor has a circuit breaker and diode bridge block. Both components are located in the IO board compartment near the shaver motor.

Volts Direct Current (VDC)

Normal Room Temperature Resistance:

120 VDC = 30 ohms or less

230 VDC = 15 ohms or less

CHECK PROCEDURE

NOTE: Use an multimeter to check operation. Deduct meter and lead resistance from final readings (short leads together to determine deduction value).

1. Reboot machine by moving toggle switch off/on.
2. Test run manual from touchscreen.
3. Test rectifier - correct readings are:

- Line voltage alternating current (VAC) inlet power
- Line voltage direct current (VDC) outlet power

1. Inspect for correct wiring from rectifier to shaver motor.
2. Isolate shaver motor by disconnecting wiring connectors.
3. Check motor winding resistance through terminals with an ohm meter.

- Within resistance range = Motor is good
- Outside resistance range = Replace motor
- Open = Replace motor

Circuit Breaker

FUNCTION

Disconnects power to the shaver motor if the amperage is too high.

SPECIFICATIONS

3 amp 250 volts 50/60 cycle

CHECK PROCEDURE

NOTE: Use a voltmeter/ohm meter to check operation.

1. Inspect the rocker switch for correct wiring.
2. Isolate the circuit breaker by disconnecting the wiring connectors.
3. Check continuity across the circuit breaker terminals.

Switch Setting	Meter Reading
ON	Closed
Off	Open

Replace the circuit breaker when the switch can not be reset or the continuity readings do not match both switch settings

Blender Motor

FUNCTION

Variable speed blender motor powers the blend pitcher blades.

SPECIFICATIONS

Volts Alternating Current (VAC)

Normal Room Temperature Resistance:

120 VDC = 5 ohms or less

230 VDC = 2.5 ohms or less

CHECK PROCEDURE

NOTE: Use an ohmmeter to check operation. Deduct meter and lead resistance from final readings (short leads together to determine deduction value).

1. Reboot machine by moving toggle switch off/on.
2. Test run manual from touchscreen.
3. Inspect for correct wiring.
4. Isolate by disconnecting the wiring connectors.
5. Check motor winding resistance through terminals with an ohm meter.

- Within resistance range = Motor is good
- Outside resistance range = Replace motor
- Open = Replace motor

Manual Rinse Push Button

FUNCTION

Allows manual rinsing of containers without requiring a magnet to actuate the water valve.

SPECIFICATIONS

SPST push button switch

CHECK PROCEDURE

NOTE: Use a voltmeter/ohm meter to check rocker switch operation.

1. Inspect the switch for correct wiring.
2. Isolate the switch by disconnecting the wiring connectors.
3. Check continuity across the rocker switch terminals.

Switch Setting	Meter Reading
ON	Closed
Off	Open

Replace if continuity readings do not match both switch settings.

Compressor Electrical Diagnostics

THE COMPRESSOR DOES NOT START OR WILL TRIP REPEATEDLY ON OVERLOAD.

Check Resistance (Ohm) Values

Compressor windings can have very low ohm values. Use a properly calibrated meter.

Perform the resistance test after the compressor cools. The compressor dome should be cool enough to touch (below 120°F/49°C) to assure that the overload is closed and the resistance readings will be accurate.

Single Phase Compressors

Disconnect power then remove the wires from the compressor terminals.

The resistance values between C and S and between C and R, when added together, should equal the resistance value between S and R.

If the overload is open, there will be a resistance reading between S and R, and open readings between C and S and between C and R. Allow the compressor to cool, then check the readings again.

Check Motor Windings to Ground

Check continuity between all three terminals and the compressor shell or copper refrigeration line. Scrape metal surface to get good contact. If continuity is present, the compressor windings are grounded and the compressor should be replaced.

COMPRESSOR DRAWING LOCKED ROTOR

To determine if the compressor is seized, check the amp draw while the compressor is trying to start.

The two likely causes of this are a defective starting component and a mechanically seized compressor.

To determine which you have:

Install high and low side gauges.

Try to start the compressor.

Watch the pressures closely.

If the pressures do not move, the compressor is seized. Replace the compressor.

If the pressures move, the compressor is turning slowly and is not seized. Check the capacitors and relay.

Compressor Drawing High Amps

The continuous amperage draw on start-up should not be near the maximum fuse size indicated on the serial tag.

DIAGNOSING CAPACITORS

If the compressor attempts to start, or hums and trips the overload protector, check the starting components before replacing the compressor.

Visual evidence of capacitor failure can include a bulged terminal end or a ruptured membrane. Do not assume a capacitor is good if no visual evidence is present.

A good test is to install a known good substitute capacitor.

Use a capacitor tester when checking a suspect capacitor. Clip the bleed resistor off the capacitor terminals before testing.

DIAGNOSING START COMPONENTS

If the compressor attempts to start, or hums and trips the overload protector, check the start components before replacing the compressor.

Capacitor

Visual evidence of capacitor failure can include a bulged terminal end or a ruptured membrane. Do not assume a capacitor is good if no visual evidence is present. A good test is to install a known good substitute capacitor. Use a capacitor tester when checking a suspect capacitor. Clip the bleed resistor off the capacitor terminals before testing.

Relay

The relay has a set of contacts that connect and disconnect the start capacitor from the compressor start winding. The contacts on the relay are normally open. The relay senses the voltage generated by the start winding and closes and then opens the contacts as the compressor motor starts. The contact remain open until the compressor is de-energized.

Discharge Pressure High Checklist

Improper Installation

- Refer to “Installation/Visual Inspection Checklist”

Air Condenser

- Dirty condenser fins
- High inlet air temperature (Self contained 110°F/43°C max.
- Condenser discharge air recirculation
- Defective fan motor

Other

- Overcharged
- Non-condensable (air) in system
- Wrong type of refrigerant
- Non-Multiplex components in system
- High side refrigerant lines/component restricted

Discharge Pressure Low Checklist

Improper Installation

- Refer to “Installation/Visual Inspection Checklist”

Other

- Undercharged
- Wrong type of refrigerant
- Non-Multiplex components in system

Suction Pressure High Checklist

Improper Installation

- Refer to “Installation/Visual Inspection Checklist”

Discharge Pressure

- Discharge pressure is too high and is affecting low side

Improper Refrigerant Charge

- Overcharged (also see Discharge Pressure High Checklist)
- Wrong type of refrigerant

Components

- TXV flooding
- Defective compressor

Other

- Non-Multiplex components in system

Suction Pressure Low Checklist

Improper Installation

- Refer to “Installation/Visual Inspection Checklist”

Discharge Pressure

- Discharge pressure is too low and is affecting low side – refer to “Freeze Cycle Discharge Pressure Low Checklist”

Improper Refrigerant Charge

- Undercharged

Wrong type of refrigerant

Other

- Non-Multiplex components in system
- Restricted/plugged liquid line drier
- Restricted/plugged tubing in suction side of refrigeration system

Do not purge refrigerant to the atmosphere. Capture refrigerant using recovery equipment. Follow the manufacturer's recommendations.

Important

Multiplex assumes no responsibility for the use of contaminated refrigerant. Damage resulting from the use of contaminated refrigerant is the sole responsibility of the servicing company.

Important

Replace the liquid line drier before evacuating and recharging. Use only a Multiplex (O.E.M.) liquid line filter drier to prevent voiding the warranty

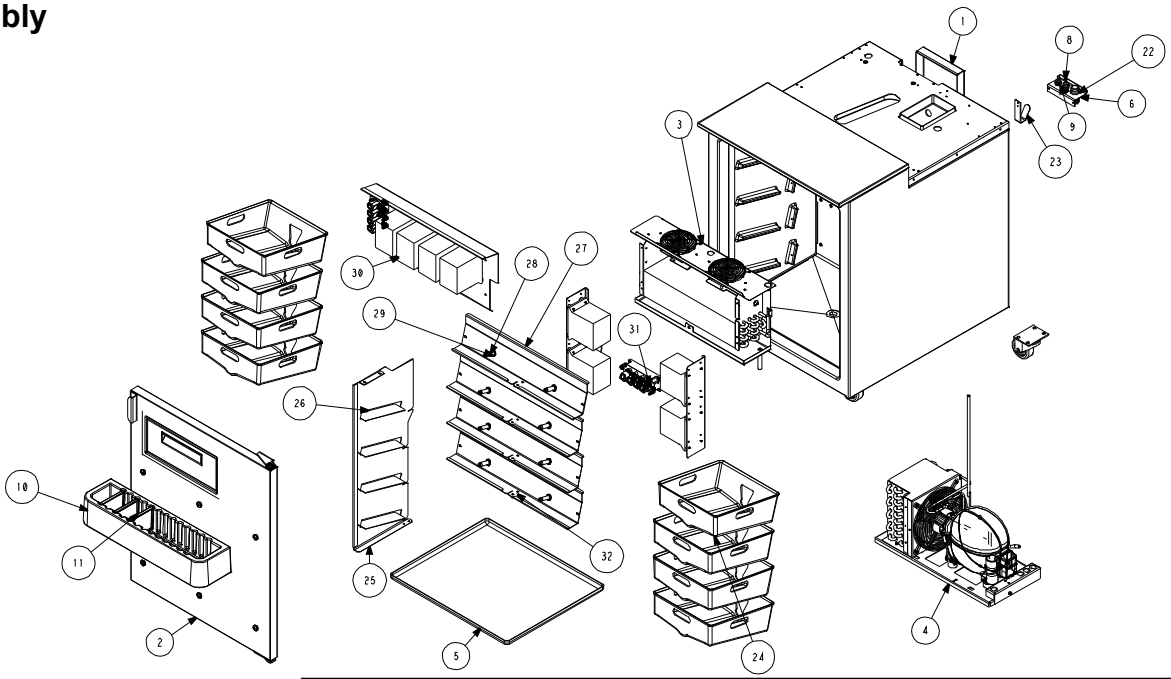
Connections

- Blended Ice Machines are critically charged. There are no refrigerant access ports.
- Locate the high and low side process tubes.
- Install a piercing valve (saddle valve) on both the high and low side process tubes.
- Remove piercing valves after charging. Unit is critically charged.
- Purge system with nitrogen while brazing to prevent build up of copper oxide in the refrigeration system.
- Manifold gauges must be removed properly to ensure that no refrigerant contamination or loss occurs. A quick disconnect is required for the high side connection unless high side valve has shut off.

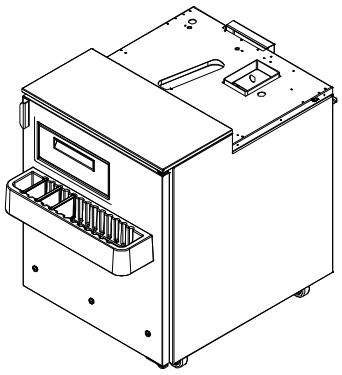
Recovery/Evacuation

1. Place the rocker switch in the OFF position.
2. Install manifold gauges, charging scale, and recovery unit or two-stage vacuum pump.
3. Open the high and low side valves on manifold gauges.
4. Perform recovery or evacuation:
5. Recovery: Operate the recovery unit as directed by the manufacturer's instructions.
6. Evacuation prior to recharging: Pull the system down to 500 microns. Then, allow the pump to run for an additional half hour. Turn off the pump and perform a standing vacuum leak check.
7. Check for leaks using an electronic leak detector after charging the Blended Ice Machine.

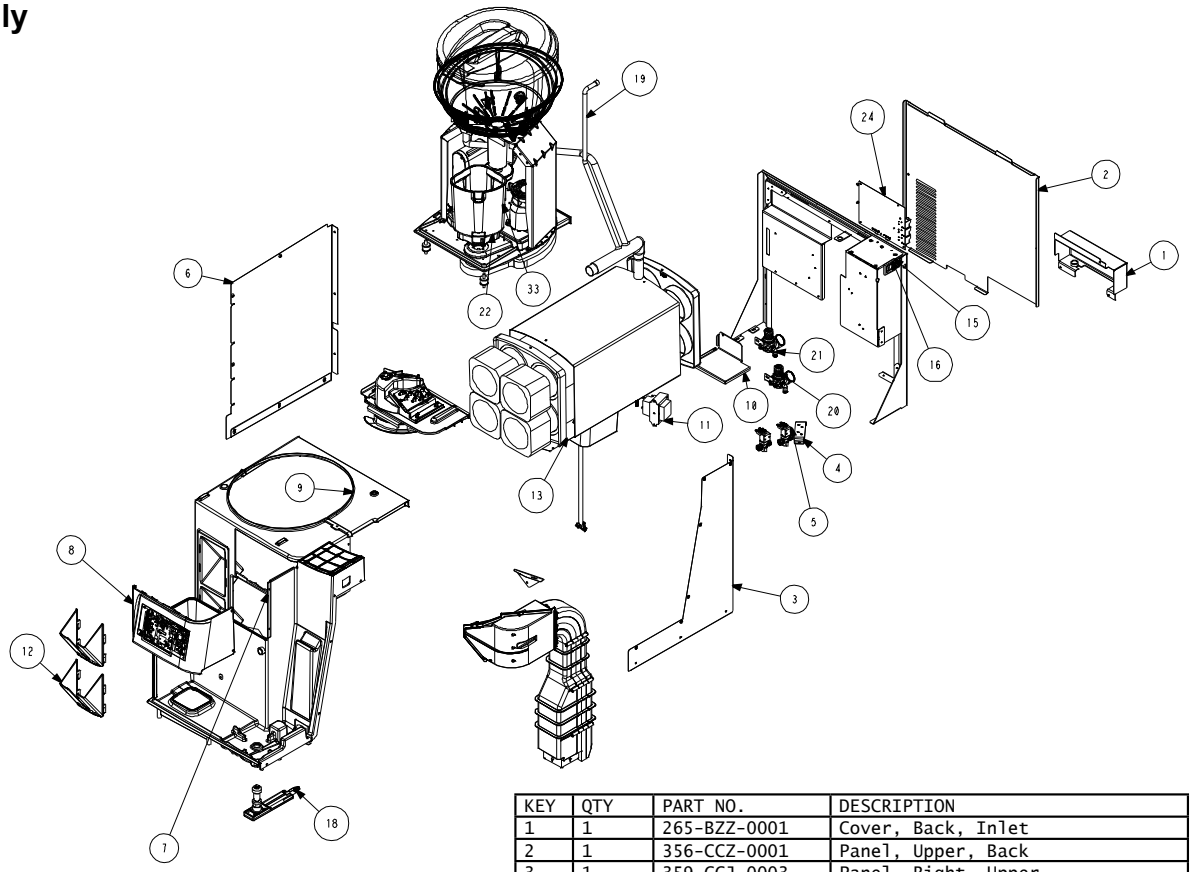
Base Assembly



-	-	P	2162730	FAN, TUBE AXIAL
34	16	P	9324096	CLAMP,OETIKER,HOSE,PRODUCT
33	6	FT	1702023	TUBING,9/16ODX5/16ID,CLEAR
32	2	EA	9321041	NUT, ACORN, #10-24, CHROME PLATED
31	1	P	000-CDS-0004	ASSY, LOWER PUMP, LH
30	1	P	000-CDS-0002	ASSY,VALVE & PUMP,TOP
29	8	P	SNAPRING	RING, SNAP,11/16 SHAFT
28	8	P	3547782	FITTING, PRODUCT TO PUMP
27	4	P	270-CDY-0001	SHELF,PRODUCT STOP
26	4	P	270-CI6-0000	PLATE,BIN SPRT
25	1	P	270-CI5-0000	SUPPORT, CNT, BIN
24	8	P	1706267	BIN,PRODUCT,HORZ
23	1	P	263-428-0000	BRACKET,SHY CORD HOOK,SMALL
22	1	P	3547778	COUPLING,BARBED,1.00
21	1	P	9291329	LABEL,MULTIPLEX,PARTS/SERVICE
20	1	P	9294281	LABEL,CO2
19	2	P	9291328	LABEL,SMOOTHIE,BLANK8
18	2	P	9291327	LABEL,SMOOTHIE,BLANK7
17	2	P	9291326	LABEL,SMOOTHIE,CARAMEL
16	2	P	9291325	LABEL,SMOOTHIE,MOCHA
15	2	P	9291324	LABEL,SMOOTHIE,BLANK4
14	2	P	9291323	LABEL,SMOOTHIE,YOGURT
13	2	P	9291322	LABEL,SMOOTHIE,WILDBERRY
12	2	P	9291321	LABEL,SMOOTHIE,STRAWBERRY
11	3	P	1706195	RACK SYRUP DIVIDER
10	1	P	1706194	RACK SYRUP
9	1	P	3237385	COUPLING,MALE,1/4" BARB
8	1	P	3237375	COUPLING,FEMALE,1/4" BARB
7	4	FT	3547769	TUBE,1/4 POLYETHYLENE
6	1	P	264-CDU-0002	BRKT FITTING
5	1	P	076-CDZ-0000	PAN, PRODUCT DRIP
4	1	P	000-BN5-0004	ASSY, COND UNIT, SMOOTHIE
3	1	P	000-CD0-0000	ASSY, EVAP COIL
2	1	P	000-187-0014	ASSY, DOOR, SMOOTHIE
1	1	P	028-CCZ-0000	COVER, REFG LINES, BACK
KEY	QTY	UoM	PART NO.	DESCRIPTION



Top Assembly

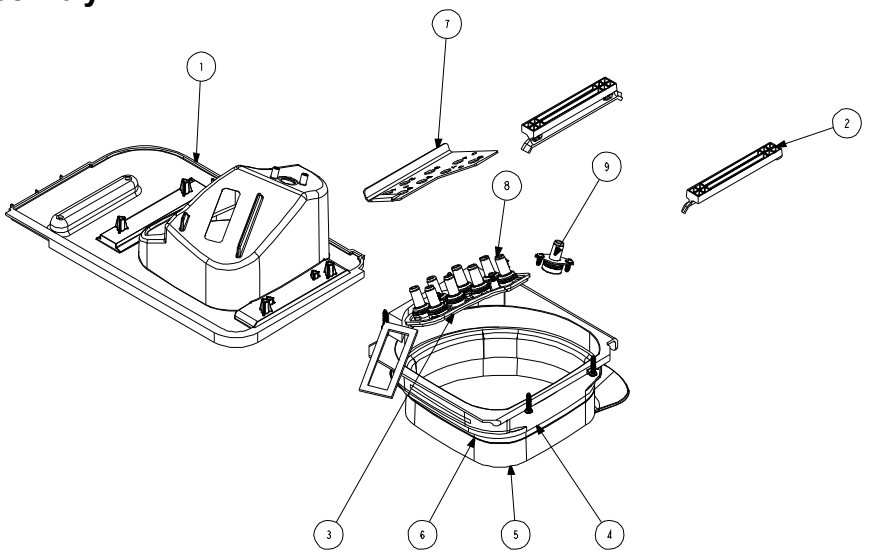


KEY	QTY	PART NO.	DESCRIPTION
1	1	265-BZZ-0001	Cover, Back, Inlet
2	1	356-CCZ-0001	Panel, Upper, Back
3	1	359-CCJ-0003	Panel, Right, Upper
4	1	025-CDR-0002	Bracket, Solenoid, Water
5	2	3547753	Valve, Solenoid, Water, 1/4”
6	1	359-CCJ-0002	Panel, Side, Outer, Side
7	1	1706159	Panel, Front, Top
8	1	2195107	Assembly, Display, UIB
9	1	1706145	Cover, Ice Bin, Top
10	1	027-CCZ-0002	Cover, Electric Box, Upper
11	1	2195105	Transformer, 75VA, 120V to 24V
12	2	1706142	Bracket, Lid Dispenser
13	1	1706126	Bracket, Pitcher, Rinse
14	1	2195125	Probe, Thermistor, Cab, BIDM
15	1	1706262	Gasket, Switch, BIDM
16	1	2194400	Switch, Rocker, 20A, 6000
17	1	2195126	Probe, Thermistor, Prod, BIDM
18	1	3547773	Fitting, 1/8” MPT to 1/4” PTC
19	1	1706218	Tube, Drain, Dipped
20	1	3547777	Regulator, Water, CO2
21	1	3547774	Regulator, Pressure, Water
22	1	1706221	Gasket, Blender, Outlet
23	1	3237378	Fitting, 1/4” PTC, WYE
24	1	2195110	Board, Control, Smoothie
25	1	3547779	Coupling, 1/4 Stem x 5/16 Barb
26	1	9324099	Clamp, Oetiker, Hose, Rinse
27	1	9324100	Clamp, Oetiker, Hose, Vitamix
28	1	9324098	Clamp, Oetiker, Hose, Drain
29	5	1702022	Tubing, 3/8OD x 1/4ID, Clr Blue
30	10	3547769	Tube, 1/4 Polyethylene
31	4	9321035	Nut, O 25-20
32	5	9324084	Nut, J-Style, Clip-On
33	4	9324078	Mount, Sandwich, 1/4-20
-	-	1706175	Cup Dispenser
-	-	1706183	Gasket, Nozzle Block
-	-	3547765	Nozzle, Spray, Rinse Area
-	-	2162731	Switch, Manual Rinse

Miscellaneous Parts

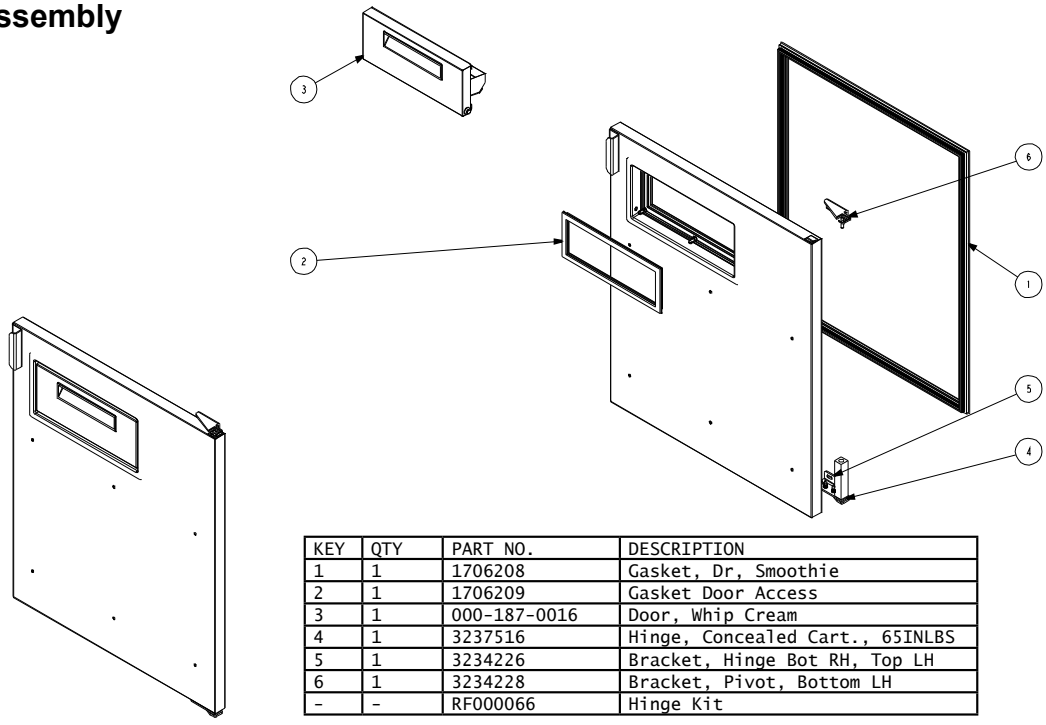
PART NO.	DESCRIPTION
1706138	Bottle, Squeeze, Cleaning
000-BIC-0008	Cleaning Kit
3239631	Cleaning Pitcher
3235029	Tool, Scale & Calibration
1702019	Tubing, 1/2id x5/8od, PVC, Clear (2ft length)

Duct Outlet Assembly



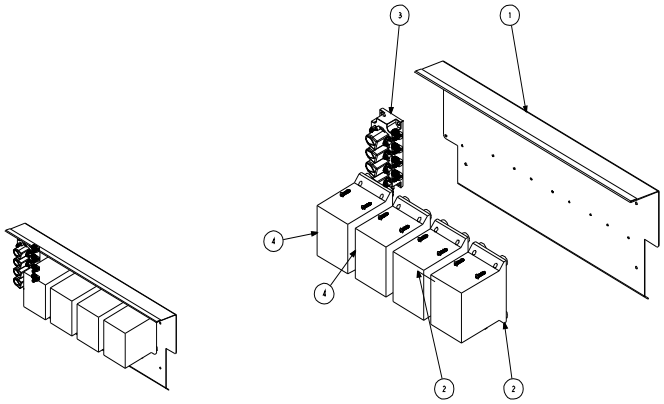
KEY	QTY	PART NO.	DESCRIPTION
1	1	1706148	Cover, Dispense Manifold
2	2	1706202	Rail, Retainer, Splash
3	1	1706166	Block, Tube
4	1	1706196	Bracket, Splash, Pitcher Outer
5	1	1706201	Bracket, Splash, Inner, Lower
6	1	1706200	Bracket, Splash, Inner, Upper
7	1	270-CCQ-0006	Bracket, Dispenser Head
8	9	1706172	Valve, Dispense Oulet, LMS
9	1	372-CCQ-0009	Plate, Ambient H2O
-	-	000-BIC-0010-S	Splash Shield Assembly

Door Assembly



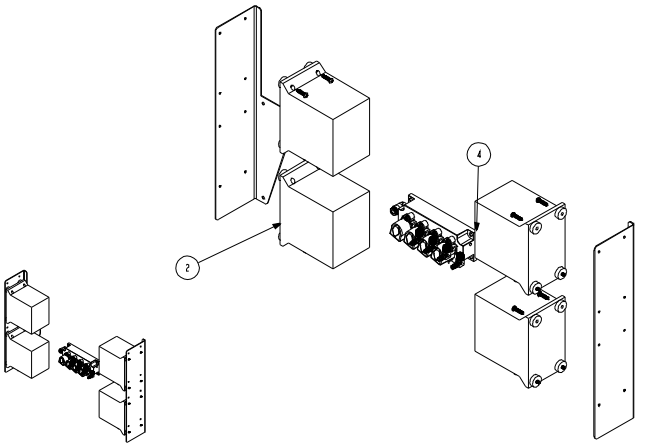
KEY	QTY	PART NO.	DESCRIPTION
1	1	1706208	Gasket, Dr, Smoothie
2	1	1706209	Gasket Door Access
3	1	000-187-0016	Door, Whip Cream
4	1	3237516	Hinge, Concealed Cart., 65INLBS
5	1	3234226	Bracket, Hinge Bot RH, Top LH
6	1	3234228	Bracket, Pivot, Bottom LH
-	-	RF000066	Hinge Kit

Top Valve & Pump Assembly



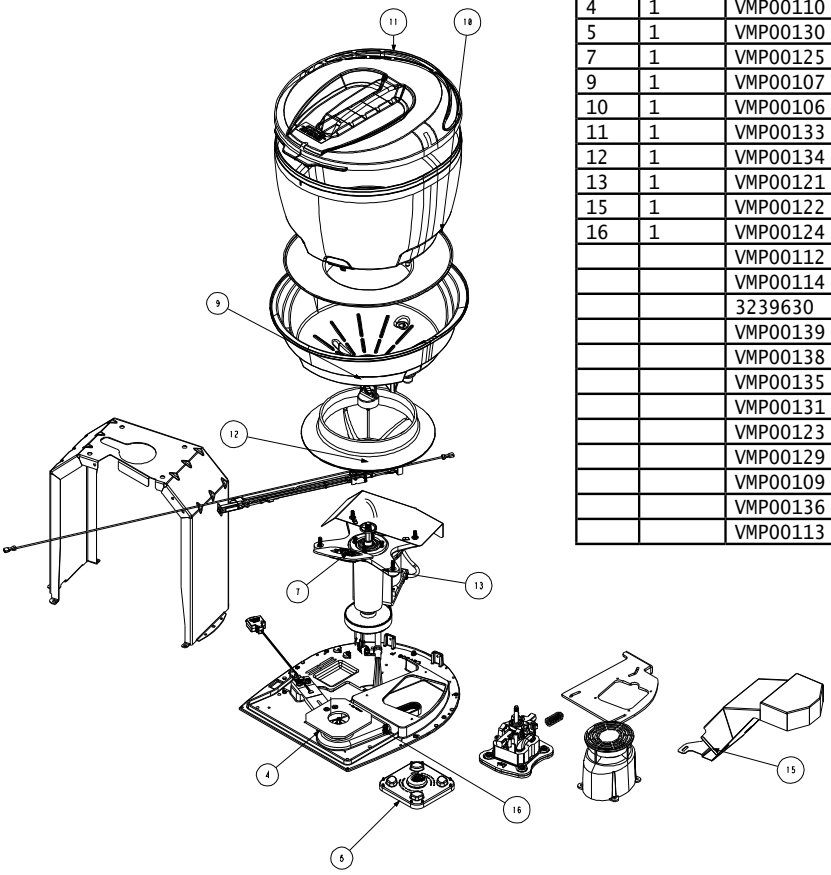
KEY	QTY	PART NO.	DESCRIPTION
1	1	270-CD5-0001	COVER, EVAP, SMOOTHIE
2	2	3239655	SYRUP PUMP
3	1	3239636	SOLENOID BLOCK, BIM, NORGREN
4	2	3239655	PUMP, PULP, FLOJET

Lower Pump Assembly



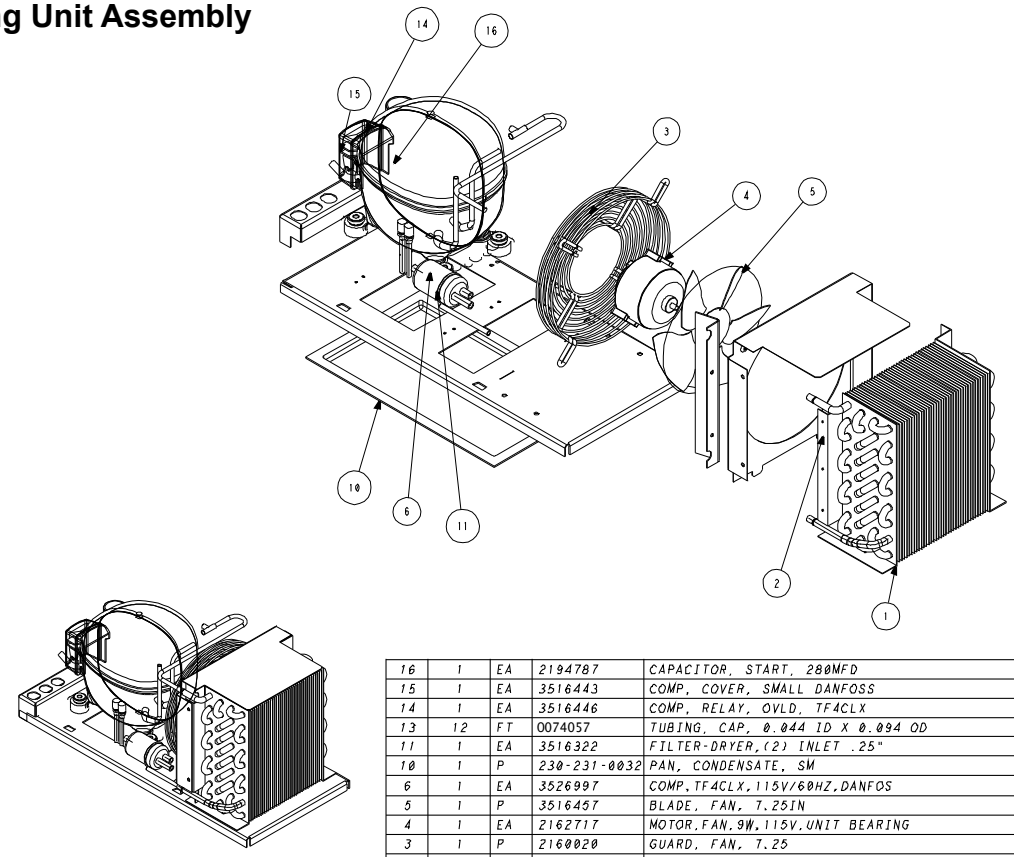
KEY	QTY	PART NO.	DESCRIPTION
2	4	3239655	SYRUP PUMP
4	1	3239636	SOLENOID BLOCK, BIM, NORGREN

VitaMix Assembly



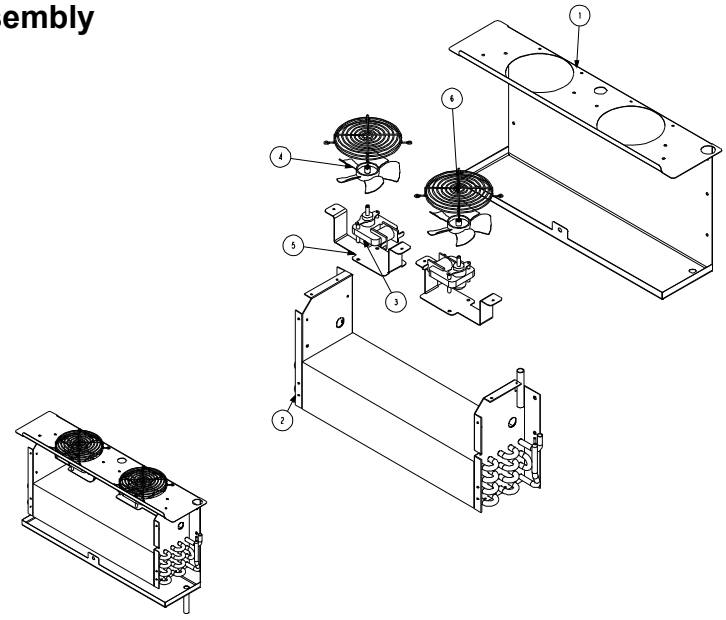
KEY	QTY	PART NO.	DESCRIPTION
4	1	VMP00110	Container Base Plate
5	1	VMP00130	PBS Container Pad
7	1	VMP00125	Shaver Blade Kit (with shims)
9	1	VMP00107	Paddle Nut
10	1	VMP00106	PBS Ice Shelf
11	1	VMP00133	Ice Bin Lid
12	1	VMP00134	Safety Interlock Push Rod
13	1	VMP00121	Power Cord
15	1	VMP00122	Control Board
16	1	VMP00124	Drive Belt, Blender
		VMP00112	120V 3A Circuit Breaker
		VMP00114	Beam
		3239630	Blending Container (W/ blades)
		VMP00139	Blending Container Only
		VMP00138	Cable, Beam to VM
		VMP00135	Chain Acct Repair Kit
		VMP00131	Container Wrench (included in VMP00135)
		VMP00123	Drive Belt, Shaver
		VMP00129	Drive Socket
		VMP00109	Ice Bin Grommet 3 Pack
		VMP00136	PBS Centering Tool
		VMP00113	Safety Switch/Rectifier Assembly

Condensing Unit Assembly



KEY	QTY	UoM	PART NO.	DESCRIPTION
16	1	EA	2194787	CAPACITOR, START, 280MFD
15	1	EA	3516443	COMP, COVER, SMALL DANFOSS
14	1	EA	3516446	COMP, RELAY, OVLD, TF4CLX
13	12	FT	0074057	TUBING, CAP, 0.044 ID X 0.094 OD
11	1	EA	3516322	FILTER-DRYER,(2) INLET .25"
10	1	P	230-231-0032	PAN, CONDENSATE, SM
6	1	EA	3526997	COMP,TF4CLX,115V/60HZ,DANFOS
5	1	P	3516457	BLADE, FAN, 7.25IN
4	1	EA	2162717	MOTOR,FAN,9W,115V,UNIT BEARING
3	1	P	2160020	GUARD, FAN, 7.25
2	1	P	026-C58-0001	SHROUD, 1/5 HP COND. COIL
1	1	P	3517381	COIL, COND, SMOOTHIE

Evaporator Coil Assembly



KEY	QTY	UoM	PART NO.	DESCRIPTION
6	2	P	2160022	GUARD,FAN,4.7"
5	2	P	372-A9Y-0002	BRACKET,FAN,EVAP
4	2	P	3517383	BLADE,FAN,4.5 IN,CW
3	2	P	2162691	MOTOR, FAN,115V, 50/60, UPPCO/BAY
2	1	P	3517382	COIL,EVAP,SMOOTHIE
1	1	P	019-CD1-0000	BODY, EVAP. COIL

Charging Procedures

The charge is critical on all Multiplex Blended Ice Machine. Use a scale to ensure the proper charge is installed. A quick disconnect is required for the high side connection.

1. Be sure the rocker switch is in the OFF position.
2. Close the vacuum pump valve and the low side manifold gauge valve.
3. Open the high side manifold gauge valve.
4. Open the refrigerant cylinder and add the proper refrigerant charge (shown on nameplate) through the discharge service valve.
5. Close the high side on the manifold gauge set. Add any remaining vapor charge through the suction access fitting (if necessary).
6. Let the system “settle” for 2 to 3 minutes.
7. Place the rocker switch in the ICE position.

NOTE: Manifold gauges must be removed properly to ensure that no refrigerant contamination or loss occurs.

1. Make sure that all of the vapor in the charging hoses is drawn into the Blended Ice Machine before disconnecting the charging hoses.

- Run the Blended Ice Machine in the freeze cycle.
- Verify the refrigerant cylinder valve is closed.
- Open the high and low side valves on the manifold gauge set. Any refrigerant in the lines will be pulled into the low side of the system.
- Allow the pressures to equalize while the Blended Ice Machine is in the freeze cycle.
- Close the high and low side manifold gauge set.
- Remove the hoses from the Blended Ice Machine and install the caps.

System Contamination Cleanup

General

This section describes the basic requirements for restoring contaminated systems to reliable service.

Important

Multiplex assumes no responsibility for the use of contaminated refrigerant. Damage resulting from the use of contaminated refrigerant is the sole responsibility of the servicing company.

DETERMINING SEVERITY OF CONTAMINATION

System contamination is generally caused by either moisture or residue from compressor burnout entering the refrigeration system.

Inspection of the refrigerant usually provides the first indication of system contamination. Obvious moisture or an acrid odor in the refrigerant indicates contamination.

If either condition is found, or if contamination is suspected, use a Total Test Kit from Totaline or a similar diagnostic tool. These devices sample refrigerant, eliminating the need to take an oil sample. Follow the manufacturer’s directions.

If a refrigerant test kit indicates harmful levels of contamination, or if a test kit is not available, inspect the compressor oil.

1. Remove the refrigerant charge from the Blended Ice Machine.
2. Remove the compressor from the system.
3. Check the odor and appearance of the oil.
4. Inspect open suction and discharge lines at the compressor for burnout deposits.
5. If no signs of contamination are present, perform an acid oil test to determine the type of cleanup required.

CONTAMINATION/CLEANUP CHART

Symptoms/Findings	Required Cleanup Procedure
No symptoms or suspicion of contamination	Normal evacuation/ recharging procedure
Moisture/Air Contamination symptoms Refrigeration test kit and/or acid oil test shows contamination Refrigeration system open to atmosphere for longer than 15 minutes No burnout deposits in open compressor lines	Mild contamination cleanup procedure
Mild Compressor Burnout symptoms Oil appears clean but smells acrid Refrigeration test kit or acid oil test shows harmful acid content No burnout deposits in open compressor lines	Mild contamination cleanup procedure
Severe Compressor Burnout symptoms Oil is discolored, acidic, and smells acrid Burnout deposits found in the compressor, lines, and other components	Severe contamination cleanup procedure

Mild System Contamination Cleanup Procedure

1. Replace any failed components.
2. If the compressor is good, change the oil.
3. Replace the liquid line drier.

NOTE: If the contamination is from moisture, use heat lamps during evacuation. Position them at the compressor, condenser and evaporator prior to evacuation. Do not position heat lamps too close to plastic components, or they may melt or warp.

Dry nitrogen is recommended for this procedure. This will prevent CFC release.

1. Follow the normal evacuation procedure, except replace the evacuation step with the following:

- Pull vacuum to 1000 microns. Break the vacuum with dry nitrogen and sweep the system. Pressurize to a minimum of 5 psig.
- Pull vacuum to 500 microns. Break the vacuum with dry nitrogen and sweep the system. Pressurize to a minimum of 5 psig.
- Change the vacuum pump oil.
- Pull vacuum to 500 microns. Run the vacuum pump for 1/2 hour .

NOTE: You may perform a pressure test as a preliminary leak check. You should use an electronic leak detector after system charging to be sure there are no leaks.

1. Charge the system with the proper refrigerant to the nameplate charge.
2. Operate the Blended Ice Machine.

Severe System Contamination Cleanup Procedure

1. Remove the refrigerant charge.
2. Remove the compressor.
3. Disassemble the hot gas solenoid valve. If burnout deposits are found inside the valve, install a rebuild kit, and replace the TXV and head pressure control valve.
4. Wipe away any burnout deposits from suction and discharge lines at compressor.
5. Sweep through the open system with dry nitrogen.

NOTE: Refrigerant sweeps are not recommended, as they release CFCs into the atmosphere.

6. Install a new compressor and new start components.
7. Install suction line filter-drier in front of compressor.
8. Install a new liquid line drier.
9. Follow the normal evacuation procedure, except replace the evacuation step with the following:

- Pull vacuum to 1000 microns. Break the vacuum with dry nitrogen and sweep the system. Pressurize to a minimum of 5 psig.
- Change the vacuum pump oil.
- Pull vacuum to 500 microns. Break the vacuum with dry nitrogen and sweep the system. Pressurize to a minimum of 5 psig.
- Change the vacuum pump oil.
- Pull vacuum to 500 microns. Run the vacuum pump for 1 additional hour.

10. Charge the system with the proper refrigerant to the nameplate charge.
11. Operate the refrigeration system for one hour. Then, check the pressure drop across the suction line filter-drier.

- If the pressure drop is less than 2 psig, the filter-drier should be adequate for complete cleanup.
- If the pressure drop exceeds 2 psig, change the suction line filter-drier and the liquid line drier. Repeat until the pressure drop is acceptable.
- Operate the refrigeration system for 48 – 72 hours. Replace the suction line and liquid line drier if necessary.

Filter-Driers

The filter-driers used on Multiplex Blended Ice Machines are manufactured to Multiplex specifications.

A Multiplex filter-drier has high moisture and acid removal capability.

The size of the filter-drier is important. The refrigerant charge is critical. Using an improperly sized filter-drier will cause the Blended Ice Machine to be improperly charged with refrigerant.

Listed below is the recommended OEM field replacement drier:

Model	Drier Size	End Connection Size
MS-8-1H	DML-032S	1/4”
MS-8-EH	DML-032S	1/4”

Driers are covered as a warranty part. The drier must be replaced any time the system is opened for repairs.

Total System Refrigerant Charge

This information is for reference only. Refer to the Blended Ice Machine model/serial number tag to verify the system charge. Serial plate information overrides information listed on this page.

NOTE: All machines listed use R404A refrigerant.

Model	Air-Cooled
MS-8-1H	12 Ounces
MS-8-EH	12 Ounces

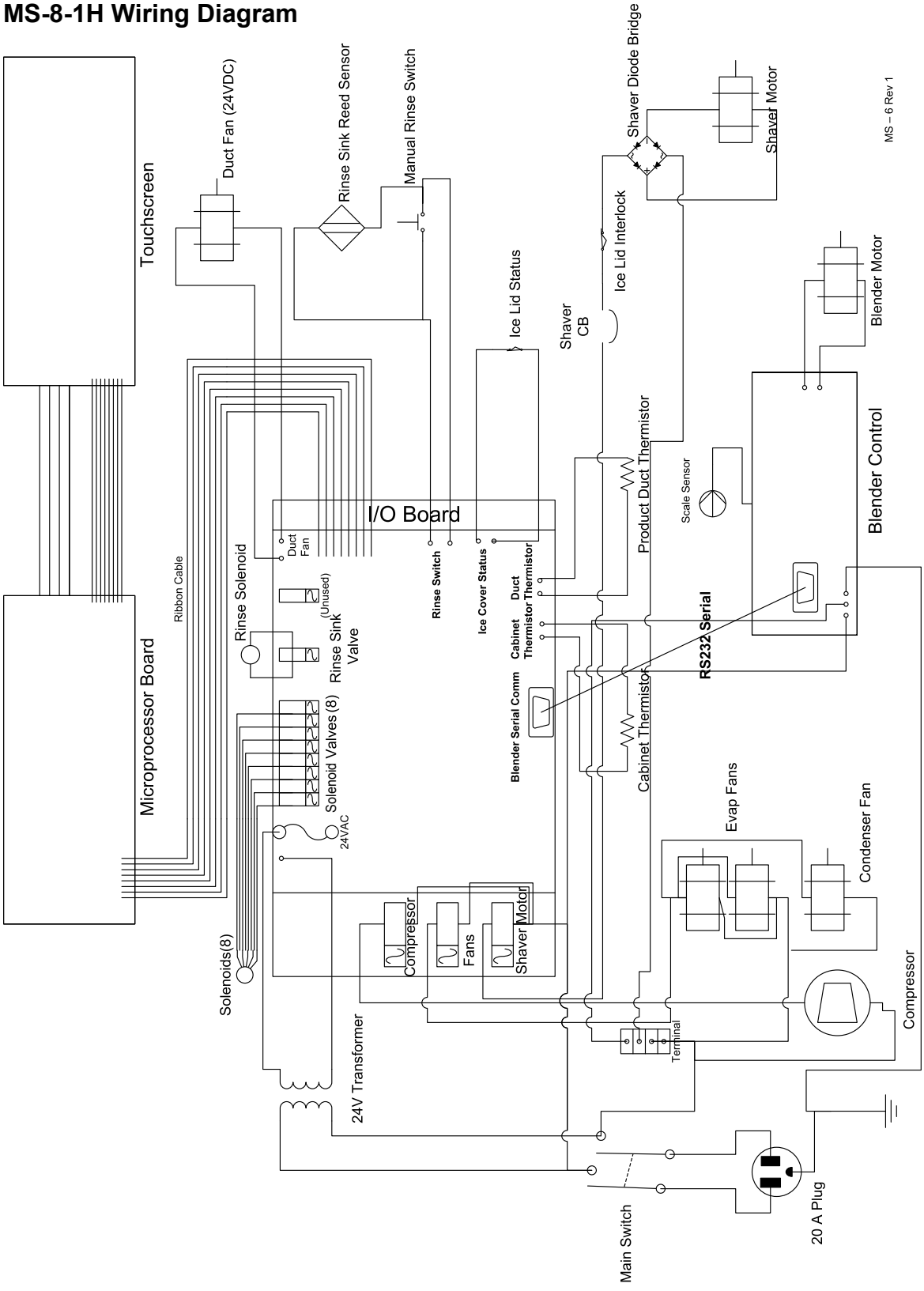
Operating Pressures Chart

Characteristics will vary depending on operating conditions.

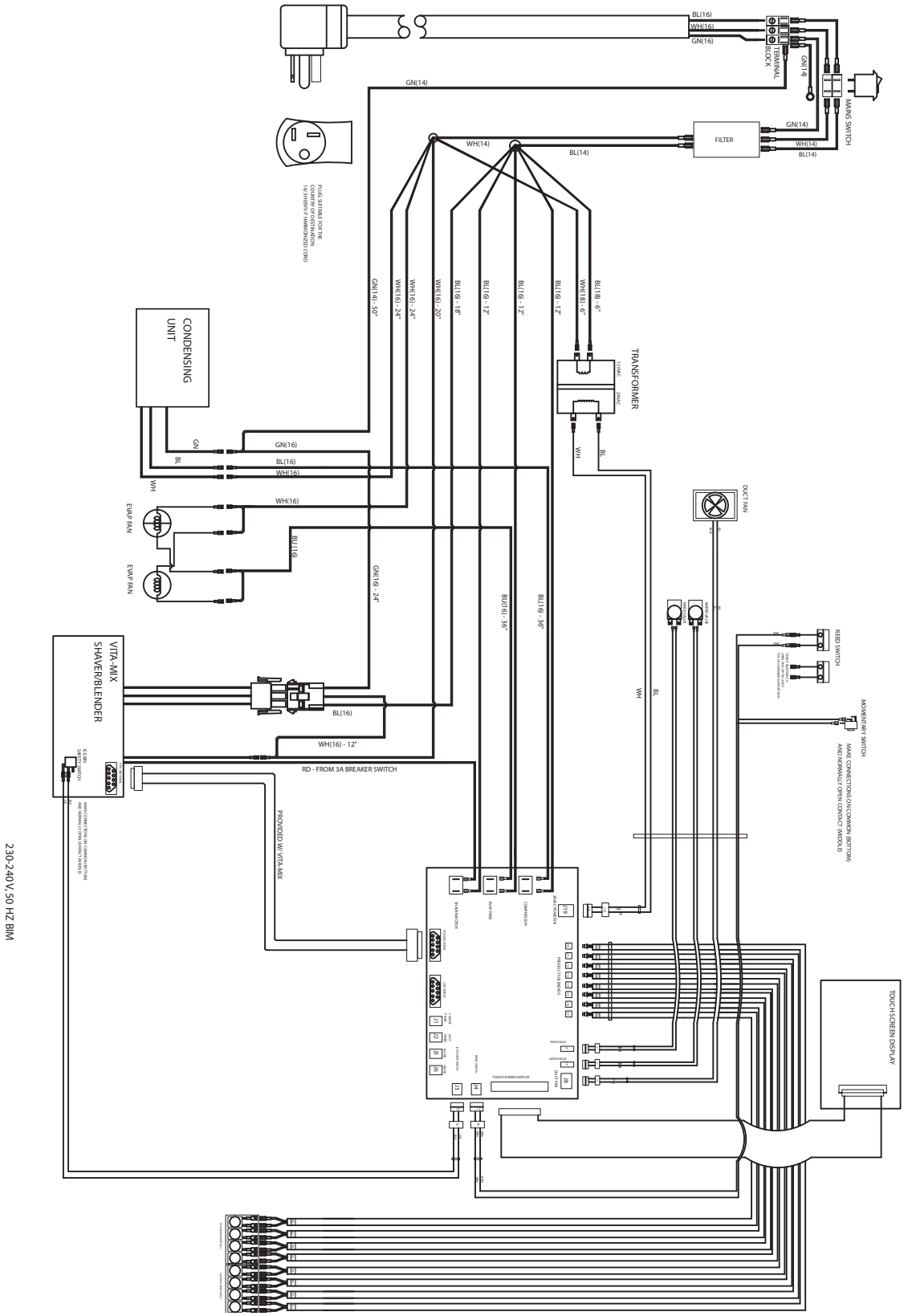
OPERATING PRESSURES

Air Temperature Entering Condenser °F/°C	Discharge Pressure PSIG	Suction Pressure PSIG
50/10		
70/21		
80/27	205-290	48-62
90/32		
100/38		
110/43		

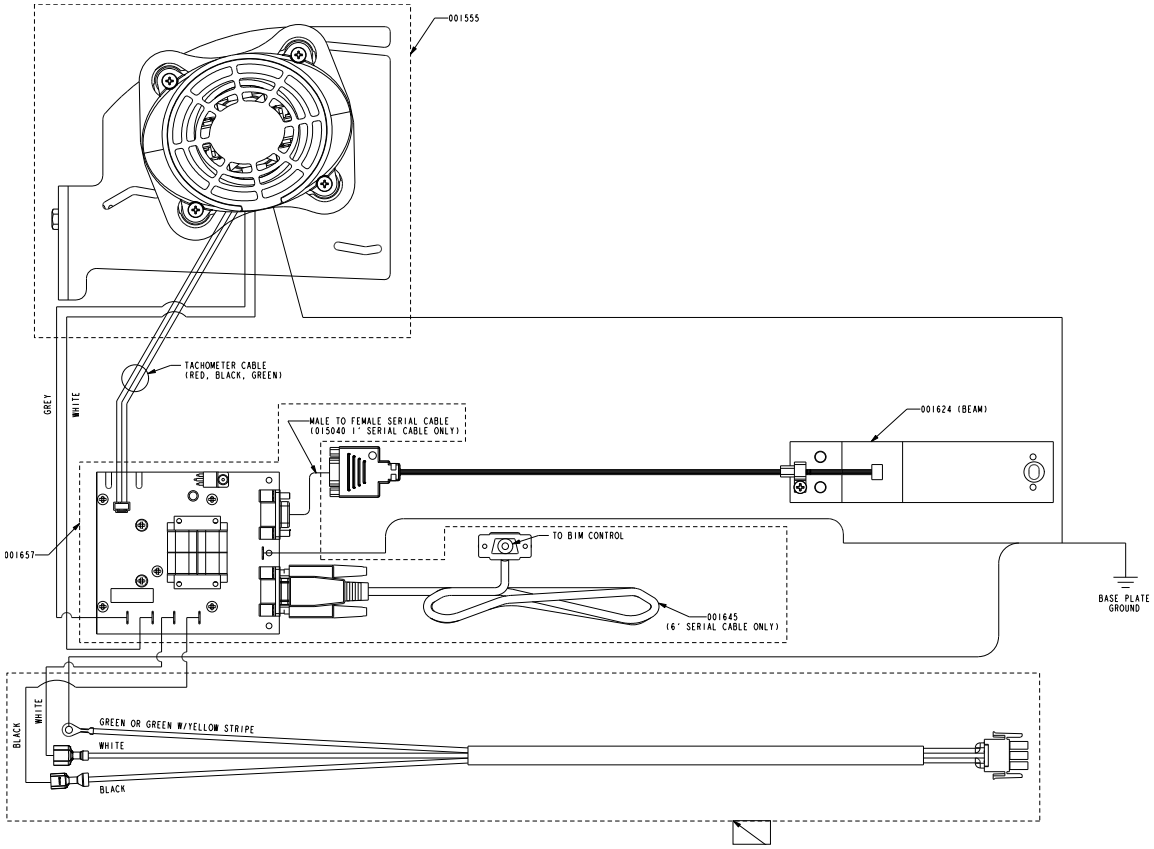
MS-8-1H Wiring Diagram



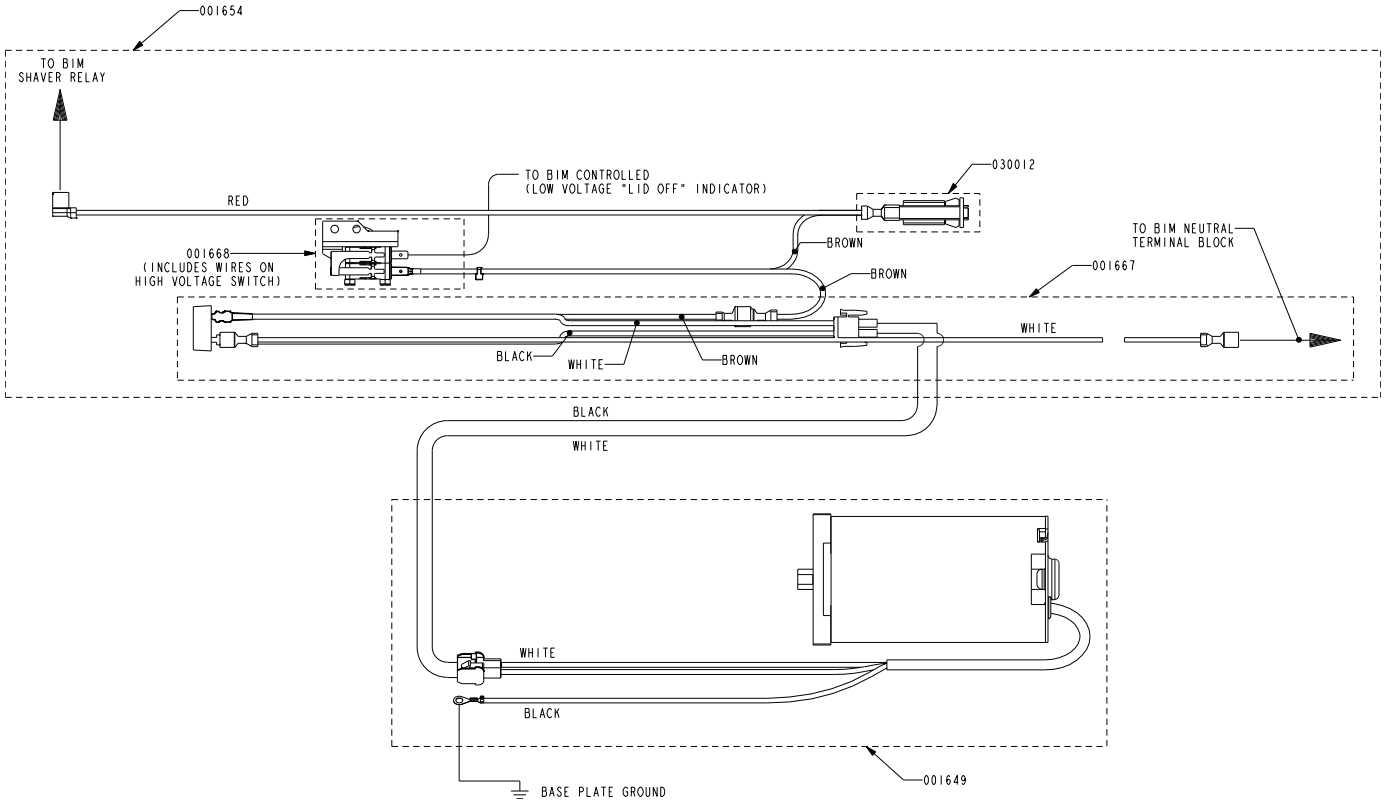
MS-8-EH Wiring Diagram



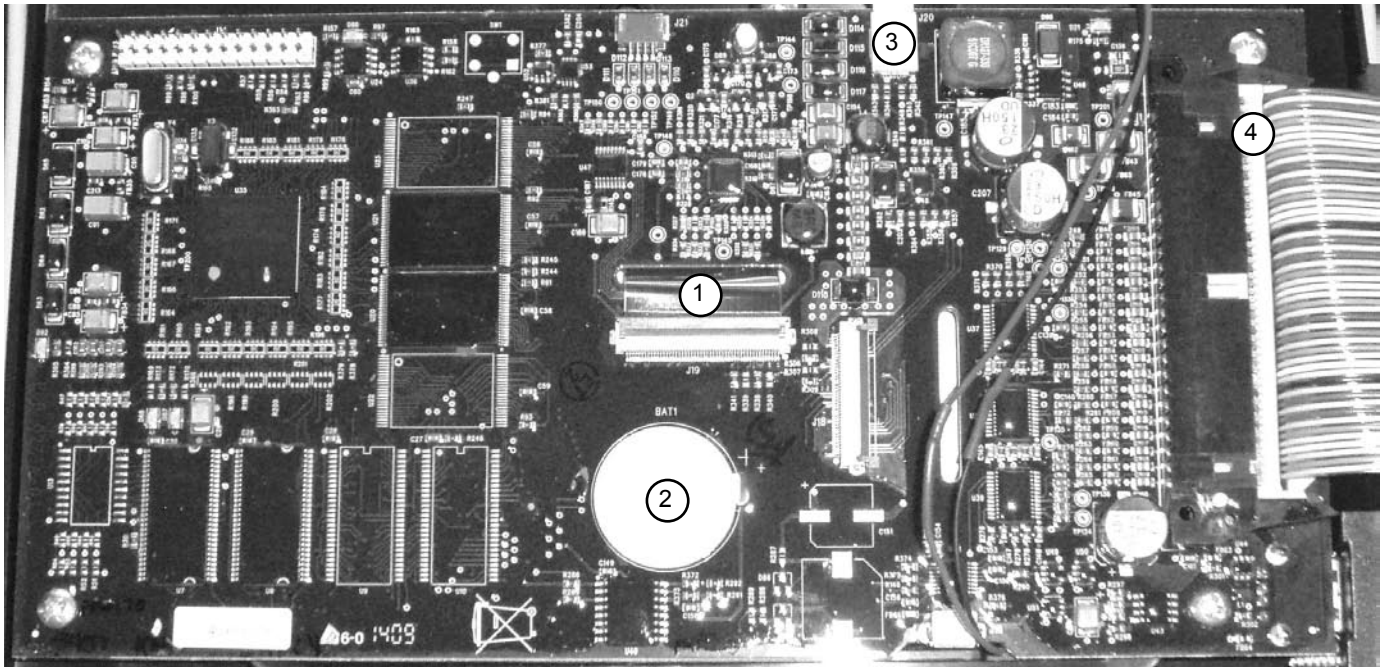
Blender Scale Schematic



Shaver Schematic



Electronic Control Board



1. LCD Ribbon Connector
   - Verify strip is even. There is a line on the strip, it needs to be parallel with the edge of the lock
   - Lift lock up to 90° to remove and reinsert strip connector
2. Backup Battery
   - Verify cable from relay board is connected and locked in place
3. LCD Power Connector
   - Verify power connector for LCD touchscreen is securely connected
4. MCB Connector
   - Verify strip connector is secure and connected

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Thank you for choosing Manitowoc Foodservice!

Help is a phone call away. Help our team of professional, courteous customer service reps by having your model number and serial number available at the time of your call (888) 436-5442.

Model: _____ S/N: _____

Installation Date: _____

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